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UNESCO-UNEP International Environmental Education Programme

99
**Sub-Regional Workshop
on
Teacher Training
in
Environmental Education**

March 3-16, 1983

REPORT

Organised by
Department of Education in Science and Mathematics



राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
National Council of Educational Research and Training

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National Council of Educational Research and Training

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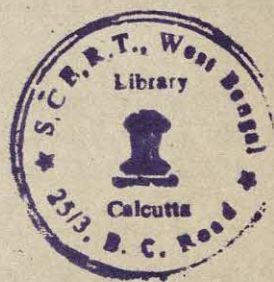
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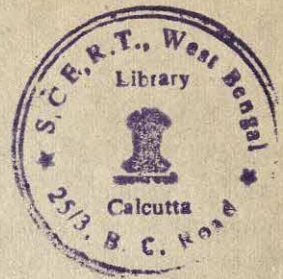
Rapporteurs

DR. U. MALLIK
DR. SUMAN BALA MALIK
SRI R. JOSHI

Editors

DR. NALINI JOSHI
DR. SUMAN BALA MALIK
SRI R. JOSHI





Foreword

The last two decades have witnessed a global concern for the conservation of nature and natural resources and their proper management. The need for imparting meaningful environmental education to all has in this context assumed significance all over the world. In developing countries particularly, the challenges posed by rapidly changing scenes of natural and social environment as a result of unprecedented technological advances, economic and population growth require that awareness about the dangers to environment be generated as also the competence to deal with various problems.

Many national and international agencies have been working to evolve suitable strategies to cope with the growing demands of the hour. Unesco has worked out a detailed programme to develop curriculum strategies and instructional materials which are to serve as guides to educators in its member countries.

A number of modules for pre-service and in-service training of teachers and supervisors for primary and secondary schools in science and social sciences have been developed by the Unesco. These modules have been developed by the experts drawn from pioneering institutes located in different parts of the world. These modules have been developed to present a global perspective.

In order to ensure that modalities proposed subserve regional and national needs, Unesco has planned a series of sub-regional workshops to examine these modules with a view to finding out their suitability for adaptation by various countries.

This is a report of one of the sub-regional workshops which was sponsored by the Unesco and organised by the National Council of Educational Research and Training (NCERT), New Delhi, from March 3 to

March 16, 1983. The training modules developed by the Unesco were critically examined by the participants during the workshop. They made a number of useful suggestions and recommendations for adapting these modules in the participating countries. These recommendations will be useful in formulating a worthwhile programme of environmental education in these countries.

The first draft of this report was prepared by Sri R. Joshi, Dr. U. Mallik and Dr. (Mrs.) S. B. Malik of the Department of Education in Science and Mathematics, NCERT. They served as rapporteurs for the workshop. The final editing of the report was done by Dr. (Mrs.) N. Joshi, Mr. R. Joshi and Dr. (Mrs.) S. B. Malik of the same Department. I take this opportunity to thank Dr. (Mrs.) G. R. Ghosh, Course Organiser, Dr. (Mrs.) N. Joshi (Co-ordinator), the rapporteurs and the editors.

I also take this opportunity to thank the Unesco for their guidance, cooperation and support in conducting this workshop.

We hope that the report will stimulate further activity in this vital area.

P. L. MALHOTRA

Director

National Council of Educational
Research and Training

New Delhi

Contents

<i>Foreword</i>	v
Introduction	1
Proceedings of the Workshop	4
General Analysis of Module 1	15
General Analysis of Module 2	21
General Analysis of Module 3	29
General Analysis of Module 4	34
General Analysis of Module 6	39
Suggestions on Modalities of Action for Local Adaptation	46

Appendices

I Inaugural Address	49
II Welcome Address	52
III Statement for the Opening Session	59
IV Unesco-Unep International EE Programme	65
V Valedictory Address	81
VI Country Report : Democratic Republic of Afghanistan	87
VII Country Report : Bangladesh	101
VIII Country Report : Sri Lanka	105
IX Country Report : India	111
X List of Participants and Resource Persons	123
XI Working Groups	128
XII Daily Schedule	129

INTRODUCTION

Background

The sub-regional Workshop on Teacher Training in Environmental Education was organised under Unesco contract by the National Council of Educational Research and Training (NCERT), India from March 3-16, 1983 at Indian Statistical Institute, New Delhi. The workshop was planned, coordinated and conducted by the Department of Education in Science and Mathematics in collaboration with the Department of Education in Social Sciences and Humanities and the Department of Teacher Education of the NCERT. The workshop was organised in the context of the activities of the UNESCO-UNEP International Environmental Education programme IEEP of the Division of Science, Technical and vocational Education.

The NCERT has been closely associated with the activities of UNESCO-UNEP International Environmental Education Programme. A pilot project on EE for primary schools was undertaken by the NCERT during 1979-80. Another pilot project on EE for the general public on problems of urban marginal areas is to be taken up by the NCERT soon.

In 1982, the same organisation undertook the responsibility to develop a module for Inservice Training of Teachers and Supervisors in Environmental Education for the Primary level. This is one of a series of modules used in this workshop and sponsored by Unesco for pre and inservice training of primary and secondary school teachers and supervisors in EE.

The importance of EE was recognised by the NCERT in the 1970s. This is reflected in the curricular framework and the instructional materials

developed by the NCERT under new pattern of education initiated in the mid-seventies.

More recently, Government of India has bestowed upon the NCERT, responsibilities of acting as one of the pioneering institutions in the country for steering environmental education in schools and Teacher Training Centres.

Objectives of the Workshop

The successful implementation of EE programme calls for an intensive training programme for teachers, teacher educators and supervisors. In view of this Unesco has developed two documents, titled "Strategies for Developing an Environmental Education Curriculum" and "Strategies for Training of Teachers in Environmental Education". These two documents were meant to serve as discussion guides for Unesco training workshops in EE.

In continuation of this, Unesco initiated the development of a series of modules for pre and in-service training of Primary and Secondary School teachers and supervisors in Environmental Education (EE) which are fed into a series of subregional workshops on teacher training in EE.

This workshop, the first in the envisaged series had the following objectives :

1. to familiarise teacher educators with the content of the series of teacher training modules in Environmental Education prepared by Unesco.
2. to explore efficient and economic ways for the local adaptation and use of teacher training modules.
3. to explore the possibilities and identify institutions for local adaptation of the teacher-training modules in the participating Member States.
4. to exchange information and experience in the development of environmental education in the sub-region.

Participation

The participating countries were Afghanistan, Bangladesh, Srilanka and India. Each country was represented by one participant except the Host-Country India which had five participants. The Resource persons comprising teacher educators and curriculum developers were from National council of Educational Research and Training (NCERT) India. List of participants and Resource persons is given in Appendix X.

Proceedings of the Workshop

INAUGURATION

The workshop was inaugurated by Dr. T.N. Khoshoo, Secretary, Department of Environment, Govt. of India on March 3, 1983. He briefly mentioned about the cultural, social and religious practices relating to the Environment and ascertained the man's ever increasing interference with nature as one of the major factors for—the present-day environmental problems.

He observed that the intricacies of the environment are not easy to understand, we are all in the learning stage.

The five basic components of nature essential for supporting life are not independent of each other. The interference with one element may effect one or all of other components in many ways.

Many of these interrelations and interactions are still not clear to us. It is time, therefore, that in all our decisions we take into cognizance this lack of understanding about the environment, Dr. Khoshoo stressed. He pointed out that environmental problems vary from region to region therefore the curriculum in EE should be local specific.

The educationist specially the teachers & teacher educators have to play an important role in selecting the proper content and evolving appropriate methods and strategies for developing proper knowledge, skills & attitudes.

This workshop is an important step on the right direction he said.

The main emphasis should, however be on developing accurate and valid materials written in a very simple language. (Appendix I)

Welcoming the Chief Guest and the participants on behalf of Unesco, Dr. Abdul Ghafoor, briefly outlined the work done by Unesco for developing the basic documents for curriculum development and teacher training and the series of modules on teacher training (Appendix III). He also mentioned the objectives of the workshop.

Earlier, while welcoming the Chief Guest and the participants Prof. Mrs. G.R. Ghosh, Head, Department of Education in Science and Mathematics, NCERT pointed out that the concern for environment and the EE are not new to this country (Appendix II). They have been a part of our religious and cultural heritage. She also mentioned the steps taken by the Government of India and various other agencies including NCERT in creating an awareness about the environmental problems among the masses in general and school population in particular.

The inaugural function came to a close with a vote of thanks by Dr. Mrs. N. Joshi.

Programme Management

Dr. Mrs. G.R. Ghosh, Head Department of Education in Science and Mathematics, was the Programme Organiser, Dr. Mrs. Nalini Joshi, Reader, NCERT, the programme coordinator, and Dr. Mrs. S.B. Malik, Mr. R. Joshi and Dr. U. Mallik, NCERT acted as the Rapporteurs.

Country Reports

The afternoon session on March 3, and both sessions on March 4, with Mr. M.P.W. Fernando, Sri Lanka and Dr. N. Joshi, India, as moderators were devoted to the presentation of the country reports.

The report for India was presented by Mr. K. Ravi (Gujarat), Dr. Mrs. S. Srivastava (Punjab), Miss K. Vasudeva (Delhi) and Dr. M. N. Siddiqui (Delhi) with special emphasis on the status of EE in their respective States. A summary of the country reports follows.

Democratic Republic of Afghanistan

The importance of environmental education as an integral part of general education has been realised by educational planners in the Democratic Republic of Afghanistan. A revised curriculum for the entire school system has been prepared accordingly. It proposes to introduce environmental studies at all grade levels in most of the subjects in an appropriate manner. The new curriculum is being implemented in a phased manner. Starting from Class I it has now reached up to class IV.

A pilot project in environmental education for primary grade students was introduced in 1979. This project ran for a year in schools situated in ecologically different provinces of the country. The aim of the project was to train students to become ecology-minded.

Another pilot project has been initiated for the purpose of infusing various aspects of environmental education into the existing science education programme for primary and secondary schools.

Bangladesh

Bangladesh had set up the National Education Commission (1979) on the recommendation of which the National Curriculum Committee (1977) completed its task of revising the curricula from Class I to XII, based on the principles of work oriented and people oriented education. A nation-wide debate was held in 1978-79 under the auspices of the interim Education Advisory Council out of which a consensus emerged that the education system of the country should be mass and production oriented.

The education system of Bangladesh maybe broadly divided into three stages, primary, secondary and higher secondary.

Environmental Education has been introduced in Class II. The Bangladesh Textbook Board, National Institute of Education Extension, Administration and Research (NIEEAR) have brought out textbooks for the pupils. Preparation is going on to make the future generation aware of the implications of environment and life.

At present the teachers training colleges and primary training institute do not offer any special training course on environmental education for secondary and primary teachers. It may be mentioned here that environmental education is a very new concept in Bangladesh and it has been introduced only at primary level from the current year.

Sri Lanka

Environment related topics began to be introduced into the existing curriculum of Sri Lanka during the early seventies. They have been incorporated into various curricular subjects—science, social studies, health science and agriculture at the Junior Secondary level, and into botany, zoology and agriculture in the Upper Secondary classes.

In addition, there are seven Field Study Centres in the country situated in reserved forests, lagoons and river banks, where, under the supervision of their teachers, students are exposed to real-life situations to study ecological and environmental conditions. These centres are equipped with laboratories and audio-visual facilities.

India

There are 22 States and 9 Union Territories in India. There are 0.6 million primary schools, one thousand teacher training institutes and two million primary school teachers in the country.

In most of the States/Union Territories, the entrance qualification for pre-service teacher training for primary teachers is 12 years of schooling or, may be 10 years in some cases. The teacher educators would, however, be graduates with degree or diploma in teaching.

Both the teacher trainees and their educators may or may not have a science background.

The duration of pre-service training in most of the cases is 2 years, but there are still some states where the duration of the course is only one year. At present, environmental education, as such, is not a part of the curriculum of the training institutes.

The secondary teachers, are mostly graduates in their respective subjects, with a one year degree course in education. The degree courses in education are conducted by the universities.

The Curriculum Development for schools is normally the responsibility of the State Education Department. The National Council of Educational Research and Training (NCERT) situated in New Delhi, develops model materials for improving the overall quality of education and also provides guidance to the states in implementing their programmes.

Presentation On the Activities of UNESCO-UNEP-IEEP :

Dr. Abdul Ghafoor, Programme Specialist, Unesco, Paris, presented a report—on the activities of the UNESCO-UNEP International EE programme. Dr. Ghafoor's report contained a resume of the IEEP activities since 1975, with the emphasis on the follow up actions based on the Recommendations of the Tbilisi Conference. The activities were classified under five major headings, namely Promotion of Exchange of Information, Promotion of Research and Experimentation, Promotion of Training, Development of Content and Materials on EE, International Cooperation and various Conferences sponsored and supported by IEEP.

In conclusion, Dr. Ghafoor also outlined the results achieved in these areas.

Discussion on the UNESCO Documents Strategies for developing EE curriculum

In the afternoon session, Mr. R. Joshi from NCERT, India presented a summary of the Unesco document titled "Strategies for Developing an Environmental Education Curriculum : a Discussion Guide for Unesco Training workshops on Environmental Education, 1980." It was expected that this would acquaint the participants with the basic philosophy objectives and approaches to curriculum development in the field of EE, so that the participants get a broader perspective to critically examine the pre-service and in-service training modules, developed by Unesco. This presentation was followed by a lively discussion. It emerged from the discussion that the infusion (multi-disciplinary)

model for EE would be appropriate for wider adoption and convenient to introduce in the existing educational systems of the participating countries. This assumption was further supported by the experience of the introduction of Population Education Programme in India.

Other specific suggestions that emerged from the discussion were as follows.

1. There is a need for undertaking base-line survey of the existing school curricula of different countries and also in different regions/states of a country, to identify the core concepts and local problems related to the local environmental uniqueness, so that these concepts could be integrated with different disciplines at appropriate levels.
2. It was felt, that there is an urgent need, to develop through national training workshop an awareness about the scope, objectives and various other dimensions of EE amongst all functionaries in the educational hierarchy.
3. Participants also felt, that in order to effectively implement an EE programme, it is imperative that each country should have an adequate number of properly trained resource persons, through regional and sub-regional training workshops and Seminars.

Strategies for the training of Teachers in EE

On Monday, March 7, the forenoon session started with the presentation of a summary of the Unesco document titled, "Strategies for the Training of Teachers in Environmental Education : a discussion guide for Unesco training workshops on Environmental Education 1980", by Mr. K.B. Gupta, NCERT, India. This presentation was meant to familiarise the participants with the suggested strategies for pre and in-service training of teachers in EE. The following points were reiterated during the discussion that followed.

1. The need for EE has been well realised by most of the countries and their Governments. The crucial task ahead is to ensure that the broad goals and specific objectives of EE are incorporated in the national objectives and policies of education at various levels and accordingly suitable strategies be evolved.

- 2) The pre-service teacher education for the secondary school teachers is within the perview of the universities. There is a need for a greater cooperation between the universities and the school systems.
- 3) An awareness at the grassroots level is essential for the success of a new venture. It is, therefore, only logical that due importance should be attached to both pre-service and in-service teacher training.
- 4) In-service training of teachers is a problem in almost all countries, especially in India, due to the vast number of practising teachers in the country.

A summary of the same document prepared by Dr. J.C. Goel, NCERT, India was circulated, Mr. Aminullah Amin, Afghanistan and Dr. J.C. Goel, NCERT, India acted as moderators for the forenoon session.

UNESCO—Training Modules

In the morning session of March 8, a summary of the Module No : 1 for pre-service Training of Teachers and Supervisors for Primary Schools", developed by Unesco was presented by Dr. Mrs. S.B. Malik, NCERT, India. Thereafter, **four groups** were formed to examine the module critically and suggest specific action plans for its adaptation in the participating countries.

Reports from all the groups were discussed in a joint session in the afternoon. They were consolidated into one report on the Module I.

The moderators for the day's deliberations were, Miss K. Vasudeva, T.T.I. Delhi and Dr. B.D. Atreya, NCERT, India.

The summary of the module II was presented by Dr. J.S. Gill, NCERT, India on March 9, 1983. The module was critically examined in the groups and their reports were consolidated in a joint session held in the afternoon. Dr. D. Lahiry, Dr. N. K. Janghira, Shri G. Guru, Dr. B. D. Atreya and Dr. J. S. Gill all from NCERT, India, acted as moderators. They were also the authors of the Module II.

In the morning session of March, 10, Mrs. S. Sinha, NCERT, India, Presented a summary of Module VI. The group reports on the module were consolidated in the afternoon session. The moderators for the day's deliberations were Mr. K. Ravi, India and Dr. A.L.N. Sarma, NCERT, India.

The Summary of Module III was presented by Dr. Mrs. N. Joshi, NCERT, India on March 11, in the forenoon session. This was followed by group discussion and the report was finalised in the plenary session in the afternoon. The moderators were Mr. I. Hossain, Bangladesh and Dr. D. Lahiry, NCERT, India.

The report on Module IV was consolidated following similar modalities. The summary of the module was jointly presented by Dr. D. Lahiry and Dr. U. Mallik both from NCERT, India, in the forenoon session on March 14. Dr. Mrs. S. Srivastava, India, and Dr. J. Mitra, NCERT were the moderators.

Modalities

The forenoon session on the 15th March was devoted to a discussion on the modalities of adaptation of the training module to the local environments, and the needs and academic qualifications of the teacher in the participating countries. General action plan for adaptation and try-out of the modules was evolved. The institutions, who could be entrusted with the adaptation of modules were also identified for the participating countries.

In the afternoon session, the supplementary materials required for implementation of the modules were discussed. Suggestions for developing supplementary materials were finalized. Necessity of documentation of existing resources from various sources was also stressed. Dr. Mrs. S. Bhattacharya, NCERT, India acted as the moderator for both the sessions.

On the last day of the workshop, March 16, in the forenoon session, the participants discussed at length the report of the workshop. Dr. D. Lahiry and Dr. Mrs. S. Bhattacharya both from NCERT, India, were the moderators for the session.

Field Trips

Field trips were arranged during the workshop to have a first-hand experience of some of the environmental problems. A visit was arranged to see the Mathura Refinery and its effects on the historical monuments of the area, including the famous Taj Mahal. The participants were also taken to Masudpur Village Complex, near New Delhi, to see the working of a bio-gas plant.

The Delhi Water Supply and Sewage treatment Plant at the Okhla Industrial Area, New Delhi was visited by the participants to study air and water pollution in that area.

A trip was also arranged to the National Museum of Natural History (NMNH) New Delhi. Dr. S.M. Nair, Director, NMNH discussed the objectives and the programmes of the Museum. Some Educational films produced by NCERT, on the topics related to EE were screened.

A display of materials developed by NCERT was arranged by Mr. K.J. Khurana NCERT, India, during the workshop.

Valedictory

The concluding session of the workshop was held in the Auditorium of the Indian Statistical Institute, New Delhi, on March 16, 1983 at 3.00 p.m. Mrs. S. Grewal, Secretary, Ministry of Education and Culture, Government of India, was the Chief Guest. In her valedictory message Mrs. Grewal thanked the Unesco for the assistance it has provided to organise the workshop, to enable the environmental educationists of the sub-regional countries an opportunity to exchange views and experiences. She highlighted some of the crucial environmental problems threatening human survival and the existence of life on this planet. Indiscriminate acts of man both for his development and comforts have aggravated the dangers to environment.

Mrs. Grewal stressed the need for the protection of wildlife and maintenance of the ecological balance for the survival of man. Advances in science and technology, she observed, should make available the means to

allow people to live a decent life without polluting and degrading the environment. Rays of hope are seen in many recent developments, such as bio-gas plants and solar cells. These would, in the near future, meet the need for energy and fertilizers of the villagers.

She emphasized the need for environmental awareness and environmental education for the community. She stated that the Prime Minister and the Government of India, have shown their deep concern for the protection of the environment and the necessity of environmental education. She also gave an account of the progress made in different directions.

Mrs. Grewal appreciated the work of the NCERT in developing various curricular materials for the formal and non-formal system of education, recognising the physical, social and environmental needs of the communities.

She assured the continuous support of the Government of India to the cause of environmental education, and to the international community in this regard. While welcoming the Chief Guest, Dr. T.N. Dhar, the Joint Director, NCERT, India thanked Unesco for choosing NCERT as the venue of this sub-regional workshop.

Dr. Mrs. G. R. Ghosh, Head of the Department of Education in Science and Mathematics, NCERT, India presented a report on the Workshop.

Dr. Abdul Ghafoor, Unesco, Paris thanked the organisers and all the participants on behalf of Unesco and on his personal behalf.

The workshop came to a close with a formal vote of thanks by Dr. Mrs. N. Joshi, NCERT, India.

General Analysis of the Modules

The participants were divided into four groups (see Appendix XI) and each group was asked to examine the modules independently. The accepted format for discussion was with reference to :

- 1) the context of the existing status of pre-service and in service training of the primary and secondary teachers and supervisors ;

- 2) the suitability of the module and ;
- 3) the modalities of action to be taken for countrywise adaptation.

The report of each group on different modules was discussed in plenary sessions and a consolidated report on each module was evolved. Since the country reports (Appendix VI to IX) include various aspects of the educational structures prevailing in the participating countries, it was decided that the final report on each module should include only the observations relating to suitability of the contents for adaptation and the suggested modalities for future action.

Module No. 1

(an overview)

ENVIRONMENTAL EDUCATION : MODULE FOR PRE-SERVICE TRAINING OF TEACHERS AND SUPERVISORS FOR PRIMARY SCHOOLS

The module is intended for use by teacher trainers and teacher supervisors who have the responsibility for training of teachers for the primary level. The assumption is made that the primary grades are taught by generalist teachers and that pre-service training of teachers is carried out in institutions specially charged with this responsibility.

It is intended for the training of pre-service teachers who may or may not have done courses in the physical and social sciences, as integrated or separate disciplines. The content outlined is considered minimum knowledge for the teacher and it is not intended that all of it should be taught at the primary level. Environmental Education is treated as a self-contained course for the teachers, and, accordingly aims at fulfilling two broad goals.

1. To ensure that pre-service teachers themselves possess the knowledge, cognitive skills and affective attributes they are expected to impart to students at the primary level.
2. To ensure that pre-service teachers acquire these attributes in a manner that satisfies the goals of environmental education and that serves as a model for their own teaching.

Specific Objectives :

1. To increase environmental awareness, sensitivity and conscious-

ness of pre-service teachers toward the environment, its problems and their prevention and solution.

2. To acquaint essential knowledge, need for the importance and fundamental environmental concept.
3. To help pre-service teachers realize the totality of the environment as a rationale for the use of the interdisciplinary approach in school.
4. To familiarize pre-service teachers with teaching strategies in environmental education, with certain activities and experiments essential to, and motivating for the learning and teaching of this environmental dimensions of the Primary school curriculum.
5. To demonstrate to pre-service teachers the development of unit and lesson plan for environmental education with techniques for assessing the learnings.
6. To orient pre-service teachers towards strategies for the planning, development, implementation of environmental education and for evaluating the progress of primary school students.

Suitability Of The Module For Adaptation

1) Format

There was a general agreement that the format of the Module I is suitable for adaptation in the participating countries.

2) Content :

The content presented in the Module covers almost every dimension and problems related to EE. It can serve as a good guide for developing similar materials in the participating countries. The nature of EE is such, that any module, however refined, cannot be adopted as it is by any participating country. It was agreed that the Module can be adapted by the participating countries after suitable modifications highlighting the environmental conditions, both bio-physical and socio-economic ones

prevalent in that particular country. For example, in Afghanistan, content enrichment may highlight soil erosion, deforestation, floods, problems of potable water, etc. as some of the natural problems, and human settlement, conservation of wildlife, pollution etc. as the ones induced by man.

In Bangladesh, the problem to be highlighted are floods, cyclones, draught, soil erosion, deforestation, pollution of rivers, potable water and rural sanitation and nutrition.

In Sri Lanka, again floods, draught, soil erosion, deforestation, population explosion, wildlife conservation, scarcity of drinking water in dry areas, industrial pollution, rural sanitation and scarcity of fuel are some of the major problems.

In India, all the problems cited above and, air, water pollution, lithospheric pollution, urban environmental problems, rural sanitation, draughts and water-logging, salinity and estuarine pollution need special attention. Therefore, while adapting the module each participating country should highlight the specific problems cited above. The following specific observations may be considered as well :

1. Efforts should be made to elaborate the content on the process of photosynthesis keeping in view the background of the resource persons.
2. Technical terms should be introduced with proper explanations.
3. Figure 3, should be simplified to show grazing chain, decay chain etc. separately.
4. Some of the complex concepts like eco-system dynamics, decay chain, climax community, chemo-synthetic bacteria, homeostatics, negative feed-back etc. should be elaborated. Figures need to be simplified.
5. While adapting the Module the level of comprehension and requirements of classroom teachers should be kept in view.

For instance, in example 13 on Page 41, the classification of ecosystem may be simplified, Environmental implication of

socio-cultural components of the environment need be brought out.

6. Statistical data related to resources and consumption patterns should include the information with the local context.
7. Environmental problems, such as natural calamities should also be discussed in terms of national context (cyclone, draught, flood, etc.)
8. The information on the prevailing energy needs in the Caribbean region should be substituted with local situations.
9. The influences of political institutions on the environment and its problems should be discussed.
10. The pedagogical approaches, methodologies and the evaluation techniques suggested for EE in the Module were found to be appropriate. However, it was suggested that while adapting the Module, the participating countries should identify most appropriate and practical approaches, methodologies and evaluation techniques for their country keeping in view the educational structure and the teacher educators, teachers and other functionaries. These may be elaborated with proper examples.

Suggested Modalities of Action for Local Adaptation

1. Each participating country should constitute a National level Committee of experts in curriculum development, teacher education, environmental education and educational planners and administrators. The Committee would examine Module I to determine the feasibility of its adaptation and also identify the areas in pre-service teacher training as well as in environmental education which need special attention.
2. A National workshop should be organised to develop a draft of the adapted version on the Module in the light of the findings of the National Committee. The participants for the workshop may be drawn from different departments such as Agriculture,

Forest, Rural development, Industry, Energy, etc., besides experts in teacher education, curriculum development and environmental education.

3. The National Committee will also recommend the modalities for the revision of curriculum in pre-service teacher training institutes to integrate EE.
4. Translation of adapted version (draft) in regional languages.
5. Try out in a few representative teacher training colleges situated in different ecological zones.
6. Final revision and refinement of the module for wider implementation. In India, however, every State/union territory shall have to evolve a local specific variant of the module.
7. In its present form, the module is suitable only for pre-service training of teachers. For training of supervisors in each participating country, a series of national, regional, sub-regional workshops/seminars/conferences shall have to be organised for orientation of resource personnel
8. At the experimental phase if necessary International Agencies like UNESCO, UNEP and IECP may be approached for financial assistance. This would help in introduction of EE in the participating countries.

Suggested List of Institutions (Country Wise)

The following institutions in the participating countries were identified which would initiate further action for adaptation and subsequent implementation of the Module.

Afghanistan

Teacher Training Department and Science Centre, Kabul.

Bangladesh

National Institute of Education, Extension and Research, Dhaka.

Sri Lanka

Curriculum Development Cell, Colombo and Primary Teacher Training College.

India

National Council of Educational Research and Training New Delhi with the involvement of all State Councils of Educational Research and Training (SCERT), State Institutes of Science Education (SISE's) and Teacher Training Institutions. The voluntary Agencies like Vikram Sarabhai Community Science Centre, Nehru Foundation for Development and Centre for Environmental Planning and Technology at Ahmedabad; Kerala Association for Non-formal Education and Mitra Niketan at Trivandrum; Science Centre for villages, Wardha etc. may also be involved in this process.

Module No. 2

(an overview)

EXPERIMENTAL MODULE FOR IN-SERVICE TRAINING OF TEACHERS AND SUPERVISORS IN ENVIRONMENTAL EDUCATION FOR PRIMARY LEVEL

This module provides the contents of an experimental teacher training course in environmental education (EE) for the inservice training of primary school teachers and supervisors. The module is made up of units which follow more or less, a common pattern.

The module contents introduce the reader to background of international efforts for promotion of EE since 1972. The knowledge about the environment essential for the in-service training of primary school teachers and supervisors has been dealt within quite some details. It is supposed to serve as a core academic content of the in-service training course. After the unit on contents, there is a unit on the problems of environment discussing means and ways for their solution and prevention. Efforts have been made to provide sufficient content background for appreciation of the nature of problems mentioned under this unit and for achievement of the other objectives of this unit. The next unit deals with the history philosophy, goals and objectives of environmental education. It lays down some guiding principles for the inservice training of primary school teachers and supervisors. Teaching methodologies in EE with special emphasis on problem solving approaches at primary schools have been elaborated in the next unit. Experiments and activities

S.C.E.R.T., West Bengal
21.2.87
Date 3775
Acc. No.

to facilitate the teaching and learning about the environment through the primary school subjects have been presented and discussed.

The last two units deal with (a) Evaluation in EE teaching and (b) the strategies for planning, development, implementation, management and evaluation of the environmental dimension of primary school curriculum. The module provides sufficient background to primary school teachers to introduce environment based teaching in their respective subject areas.

The module is addressed to primary school teachers and supervisors who may themselves be having a minimum of 10-year schooling, though not necessarily with science as a subject. The material is intended to be used as a basic text for organisation of 2 to 4 weeks' orientation courses by the teacher training agencies. The specific objectives of this module, and through this module, of the in-service training course are as follows :

1. To increase environmental awareness, sensitivity and consciousness of in-service teachers and supervisors of primary schools towards the environment its problems and their solution and prevention.
2. To acquaint the in-service teachers and supervisors with the need, the importance, the goals, objectives and guiding principles of environmental education.
3. To acquaint the teachers and supervisors with essential knowledge about the environment and its allied problems.
4. To acquaint them with fundamental environmental concepts that may permeate primary school subjects.
5. To help them realise the totality of the environment as a fundamental base for inter-disciplinarity among primary school subjects.
6. To familiarize them with evaluation techniques and methodologies in EE for understanding the progress of primary school students ; as well as the teachers' own effectiveness in respect of EE objectives.

Suitability of the Module for Adaptation

1) Format

The format of the Module was considered by different groups and it was felt that it may be suitably adapted in the participating countries.

2) Content

1. All the participating countries felt that the Module can be adapted in their country with minor modifications depending upon local conditions.
2. The content of the Module should be suitably modified for each participating country as per its requirements of the orientation courses for in-service training.
3. The objectives listed in the document are global in nature. Besides these objectives, specific objectives relevant to local environmental conditions may also be included in the adapted version.
4. The objectives of EE as stated in the Module for training programmes were considered to have been diluted from the objectives stated in the UNESCO document. So the former should be replaced by the latter.

The need for and scope of in-service teacher training should be strengthened with socio-cultural, historical and ecological requirements of the country.

5. The ecological processes should also include some hints to indicate how these processes are disturbed.
6. The section adequately covers the bio-physical and ecological components of the environment but the social aspects of the environment need to be strengthened.

7. Social practices relating to Health, Nutrition and Sanitation and their effect on Environment should be elaborated.
8. While introducing the concept of environment distinction should be made between natural and man-made environment which have been brought afterwards.
9. Suitable illustrations and diagrams showing energy flow, nitrogen cycle and water cycle may be included.
10. Certain repetitions may be avoided when the chapters 4 and 5 are refined. For example, the concept of natural environment in the Chapter 5 may be shifted to the relevant portion in the Chapter 4.
11. Discussion on an eco-systems and its sub-systems and their interactions is easy and adequate in the Module. However, the discussion about man and eco-system should be elaborated with reference to the specific problems of the area relating to the natural eco-system.
12. Some elements of discussion on fresh water and marine biology, geo-hydrology and meteorology have to be included.
13. The discussion on different natural resources should also indicate how some of them get polluted. The chain of events that follow the pollution of a natural resource, and the consequences of these events on other resources should be exemplified.
14. Suitable diagrams, tables and graphs should be given at appropriate places.
15. Participants opined that the methodology given in the Module is suitable for their respective countries. However, in-service training courses should emphasise the development of practical skills of teaching through these methods. The examples on methodology should be linked to earlier two Chapters, i.e. Chapter 4 and 5.

16. The activities suggested for school children can serve as examples for developing similar activities relevant to the local environmental situation of the participating countries while adapting the Module.
17. In addition to this, some more activities based on the Projected environmental conditions of the region may also be included in order to make them more meaningful.
18. It should be indicated, with respect to each activity, how the results or inferences are related to the environmental factors. For example, the activity on the survey of commodities in a shop ends with the classification of the items, available. However, it is suggested that this discussion may be further extended to include how different items are linked with the environment and how some of them are likely to cause environmental problems.
19. Those religious and social practices may be identified which can be utilised for creating awareness about the environment.
20. As a part of an activity, survey sheets may be prepared to collect data on various aspects discussed in the section from agricultural, industrial, slum and urban areas.
21. Evaluation procedure should include illustrative examples based on content and methodology suggested in the earlier section of the Module. In the present form the evaluation methods seem too general.

Suggested Modalities of Action for Local Adaptation

The suggested activities for adaptation of the Module in the participating countries and the institutions which may be entrusted to take up responsibilities of implementation are given below (countrywise).

Afghanistan

1. The Academy for Teacher Education may have the responsibility of preparing an adapted version of the Module and getting it translated into official languages.

2. The Department of Teacher Training, Roshan and Said Jamaluddin Teacher Training Institutions may plan and conduct orientation courses for resource persons drawn from Teacher Training Institutes.
3. The resource persons should also be given additional training in some other countries. Unesco may provide academic guidance and funds for this purpose. The Government of India can also be approached to provide Training at NCERT for this purpose.
4. The in-service teacher training programmes for 2 to 4 weeks may be organised by Teacher Training Institutes (TTI's) where the expertise of these resource persons will be utilised.
5. The correspondence-cum-contact programmes may also be developed for in-service teacher training.

Bangladesh

1. A National Workshop may be organised by the National Curriculum Development Centre and Academy of Fundamental Education for adaptation. This may be supported by UNESCO/ UNEP : IEEP.
2. The in-service training of primary teacher educators using the Module will have to be supplemented by educational media (Radio and T.V.).
3. The following institutions and agencies were identified for adapting and implementing the in-service primary teacher education programmes in Bangladesh at the National and Sub-national level :

- 1) National Institute of Education Extension and Research;
- 2) National Curriculum Development Centre;
- 3) Academy of Fundamental Education;

- 4) Teacher Training Institutes;
- 5) Department of Education;
- 6) Bangladesh National Commission for Unesco.

The networks can be developed around TTI's. Besides, inter-departmental linkages (Environmental Pollution Control Board, Health Directorate) will also be established.

Sri Lanka

1. Adaptation of the Module and translation into regional language following the same procedures as in Module I.
2. Orientation of the Directors of Educational Regions by the Curriculum Development Centres (CDC).
3. Orientation of Teacher Educators and Supervisors by CDC.
4. In-service training of teachers will be done circuitwise, utilising the existing system of organizing 12 one-day training programmes per annum.

India

1. The Module may be modified by agencies like the NCERT on the basis of the general observation.
2. A more detailed guidelines for organising in-service programmes may be developed by NCERT and State Educational agencies.
3. The NCERT may organise orientation courses for Key personnel from States (SIE/SCERT and Supervisory personnel), who in turn, may hold similar orientation courses in their respective States to give a multiplier effect.
4. SIE/SCERT's may organise in-service courses of suitable duration for primary teachers.

5. Instructional materials specially designed for incorporating the EE content into the existing content of different subjects may be developed at the NCERT and at the state level which may be used for the in-service training programmes as source material by teachers.
6. Different strategies for providing in-service training of teachers may be tried out to find out the most efficient and economic method.
7. Resource materials on such areas as history and philosophy of EE may be developed with the Indian context.
8. Minimum action programme to be implemented by teachers in schools may be worked out during in-service programmes.

Module No. 3

(an overview)

ENVIRONMENTAL EDUCATION MODULE FOR PRESERVICE TRAINING OF SCIENCE TEACHERS AND SUPERVISORS FOR SECONDARY SCHOOLS

In this Module the student science teachers are introduced to the origins of EE as a response to the urgent environmental problems that confront mankind at local, material and global levels. The nature of this distinctive and purposive type of education is then developed via its objectives and particular characteristics. The chapter concludes with a scheme for science teachers to include an environmental emphasis in their science teaching and to recognize this as a contribution to the totality of EE.

Chapter 2 deals with the nature of science, its concepts already developed through science that relate to the environment. The various processes of science are identified and summarised, and the problem solving approach that is to be applied to an environmental issue. The processes include; observation, communication, control of variables, experimenting, hypothesising, measuring variables and concept formation.

Six stages of the teachers curriculum plan are identified and elaborated:

- 1) identifying an environmental problem area.
- 2) investigating a problem (identifying and acquiring the relevant background knowledge that is to be used by the class).
- 3) preparing and evaluating possible solutions to the problem.
- 4) getting involved.
- 5) identifying possible strategies for social action by the class and teacher,

6) evaluating the strategies for social action.

Evaluation in EE in a number of senses is discussed. Effective EE will need to be related to local, topical and current situations that can be included in large scale and permanent curricular resources.

The discussion in this chapter deals with the support science teachers need from their school authorities and in the wide educational system itself if they are to be able to contribute EE through their science lessons.

Equipping the science teachers with the concepts of EE and with the skills and strategies for its design and teaching is only one of the requirements for the implementation of EE in schools. All educational systems have constraints that hinder innovation in curriculum and teaching. The identification and control of these constraining factors are important if teaching is to become more environmental.

Four phases need to be stressed if successful implementation is to occur. These are Recognition, Identification, Responsibility and Maintenance.

SUITABILITY OF THE MODULE FOR ADAPTATION

It was observed that the approach adopted for this Module is entirely different from that for all other Modules in the series. Unlike the other Modules, it does not include a separate section on content, i. e. the knowledge about the environment and environmental problems. The activities, worksheets, tools, techniques, etc. given in the Module are sufficient to enable the teachers to handle effectively the information about environment and environmental problems. The Module can be adapted by the participating countries keeping in view the structure of their respective educational systems. For effective implementation of the Module, however, it was felt that a supplementary module or material on essential knowledge about the environment and environmental problems of each country should be developed.

1) Format

The Units, V, VI and VII, including the introduction, need a sequential treatment so that they present a more cohesive picture of ideas.

2) Content

- 1) The content and methodology is excellently integrated and taken care of by the meticulous delineation of the EE issues at the outset and the activities worksheets, based on problem solving method adopted in the module are commendable. For every activity the objectives, the expected learning outcomes, knowledge, skills attitude values have been spelt out in the Module. The activities are well thought out and planned. They are suitable for attaining the specific and well defined environmental educational objectives related to science.
- 2) The Environmental problems identified and presented as ecology, energy, population, food and resources may be strengthened with local environmental information and at the same time, it should also reflect a global picture of the environmental problems or issues.
- 3) In Unit IV and V, more information related to EE than to science concepts may be given.
- 4) The module pre-supposes the basic scientific background of the pre-service pupil teachers; however the science concepts of particular importance in EE have been given in the Appendix. This pre-supposes a basic content knowledge of the teachers, which needs to be carefully viewed before adapting the module in the existing local educational set up.
- 5) The problem solving method, though interesting and novel requires radical changes in the training methodology of the in-service teachers and teacher educators who are not fully familiar with the problem-solving method.

Suggested Modalities of Action for Local Adaptation

Afghanistan

- 1) The Commissions on Education and Science with the help of

Teacher Training Department may be assigned the responsibility of adapting this Module in the official language.

The above two agencies may provide persons who can be trained as key persons/resource team professional members. The science orientation courses may be conducted by the experts invited from other countries. Unesco or other international agencies may be approached to provide funds for the purpose.

- 3) The key persons may be involved in training of teacher educators from the teacher training institutes.
- 4) The school resources may also be strengthened for meeting the new material requirements.
- 5) In the context of Afghanistan, possibility of this module in three versions separately for Chemistry, Biology, Physics and Mathematics teachers may be required.

Bangladesh

The general modalities for adaptation of this module for Bangladesh should be the same as in case of other modules. This module would serve not only for pre-service teacher trainees but also would be useful as a source book for EE, in general.

- 1) A group of resource persons/teacher educators, with strong commitment for bringing about innovations in teaching methods, would make the implementation of the Module III effective,

Sri Lanka

- 1) The Module can be directly adapted in the present form in Sri Lanka for the training of both junior and senior secondary teachers.
- 2) The Module will have to be translated in the regional languages for the use by the teachers in schools as well as during training programme of junior science teachers,

- 3) An accompanying book on Environment and Environmental problems of Sri Lanka developed by knowledgeable persons in the country, through the joint venture of Unesco and CDC will be essential for effective implementation of training and school programme.

India

1. Modalities as suggested for adaptation of Modules I and II may also be considered while adapting this module.
2. A try-out of the module may be undertaken for its adaptation. The National Council of Educational Research and Training, India may take up the responsibility.
3. Resource materials based on the local Environment and Environmental problems may be developed.

Module No. 4

(an overview)

ENVIRONMENTAL EDUCATION : MODULE FOR IN-SERVICE TRAINING OF SCIENCE TEACHERS AND SUPERVISORS FOR SECONDARY SCHOOLS

The module includes the history and development of EE, its philosophy and guiding principles, essential knowledge about the environment and its problems; appropriate instructional strategies, sample experiments and activities, evaluation of teaching learning implementation strategies for in-service programme.

The module is a practical guide to the presentation of the environmental dimensions of science to secondary level students.

The differences in environment and school system preclude the prescription of specific implementation requirements. Each training centre should devise its own requirements based on local environmental conditions and problems, available resources and the current national, regional and global issues. However for a product oriented training programme the following requirements are suggested to be fulfilled by the management.

- (i) Preparation of course curriculum,
- (ii) Selection of Trainees,
- (iii) Preparation of Schedule of activities,

- (iv) Preparation of budget,
- (v) To be fulfilled by trainees,
- (vi) Active participation,
- (vii) Production of a lesson plan or design of an activity,
- (viii) Production of evaluation instrument.

SUITABILITY OF THE MODULE FOR ADAPTATION

1) Format

The format of the module was found suitable for adaptation in the participating countries.

2) Content

- 1) The content has a wide coverage; the implications of scientific and socio-economic factors and forces have been well brought out. The language is simple, the illustrations are clear and illuminating. The module can be adapted by the participating countries with necessary modifications.
- 2) The population dynamics concept may also include information regarding natural population along with the description given on human population.
- 3) The information given in this chapter on essential knowledge should correspond to the requirements of teachers with Physics/Geography/Mathematics background. For example, the content described on Page 67 may be too technical for these categories of teachers.
- 4) The portion on human intervention in natural processes may be shifted to the next chapter on environmental problems to make latter more effective.
- 5) The discussion on environmental problems with more illustrative data, diagram, tables and graphic representation will make the

information interesting and will also help in better understanding. The adapted version should give data reflecting the magnitude of local environmental problems.

- 6) Broad measures in relation to the solutions of the environmental problems should be strengthened by relevant data highlighting regional and global magnitudes of the environmental problems.
- 7) The information given under the control of population growth needs to be condensed.
- 8) The teaching methodologies are quite illustrative with examples giving the details of each methodology. Some of the teaching methodologies still need illustrations with suitable examples.
- 9) The module has given various methodologies for teaching EE. It has been noted that most of the in-service teacher training courses suffer from constraints of resources and time. As a result they are often not as effective as they should be. While adapting this module, care may be taken to emphasise on those methodologies which are most feasible and practicable in a particular country.
- 10) The Unit on activities and experiments has covered the content discussed in the previous Unit. It could be adapted as such as the activities are presented in a general way. At some places activities can be detailed out with local examples.
- 11) Activities to fulfill the EE objectives of commitment participation may be included.

SUGGESTED MODALITIES OF ACTION FOR LOCAL ADAPTATION

Afghanistan

1. The Module could be adapted with suitable modifications keeping in view the local need of Afghanistan.
2. The Module may be translated into local languages by the Academy of Teacher Educators and the Science Centre. The Aca-

demy of Teacher Educators may find the way of implementation for inservice teacher training programme.

3. Resource persons should get an intensive training in EE. Unesco may take necessary steps to train the resource group either in the country or outside the country.
4. The EE concepts should get more detailed treatment in the existing curriculum of each training institute. The steps should be taken to ensure that EE competencies are also developed among the inservice teachers.
5. Suitable literature in EE should be made available.

Bangladesh

1. In general the module could be adapted keeping in view the following :
 - 1) School curriculum at secondary level,
 - 2) Resources of the schools,
 - 3) Background and number of teachers,
 - 4) Examples of local environment.

Sri Lanka

A comprehensive modality of action may be evolved for adaptation of the module for training of teachers and supervisors in Sri Lanka. Following steps could be considered for adaptation :

1. Meeting of the policy makers and coordinators for taking decision.
2. Modification of module to suit the local requirements.
3. Development of supplementary books on environmental problems of Sri Lanka.

4. Translation of the adapted version in two regional languages.
5. Preparation of curricula for all levels by 5 committees.
(i) Primary, (ii) Junior Secondary Science, (iii) Junior Secondary Social Science, (iv) Senior Secondary Science, (v) Senior Secondary Social Science.
6. Orientation of regional Directors.
7. Orientation of supervisors at primary and junior and senior secondary levels.
8. Training workshop for (i) Pre-service personnel in primary and secondary levels and (ii) inservice advisers of primary and secondary levels.

Unesco assistance is needed for Steps 1-8 mentioned above.

India

1. The module needs to be suitably abridged for in-service teacher training by reducing the details of science content like the discussion on planetary system.
2. There is a need for an orientation programme for educational planners, administrators, curriculum experts, teacher educators SISE's/SCERT's at the National level.
3. The strategy of infusing the EE training in the existing in-service environmental education programmes by different agencies should be carefully worked out.

Module No. 6

(an overview)

ENVIRONMENTAL EDUCATION MODULE FOR IN-SERVICE TRAINING OF SOCIAL SCIENCE TEACHERS FOR SECONDARY SCHOOLS

This module is expected to provide assistance to individuals and institutions interested in in-service training of social science Teachers and Supervisors in Environmental Education for Secondary School.

The Module is a self-contained unit which contains (a) background for the development of this material (b) specific objectives behind the training of social science teachers in Environmental Education (c) essential knowledge about the environment and its allied problems (d) goals, objectives and guiding principles in teaching of EE (e) teaching methodologies, suggested experiments and activities and evaluation techniques in EE and (f) strategies for planning, development, implementation, management and evaluation of the environmental dimension of secondary school social science curriculum. Although concluding chapter has been mentioned in the content list, it has not been given in the module. In the last pages a bibliography has been given to provide an important source of reference for further development of EE material. A number of seminars, meetings and conferences held at national and international levels to promote the world-wide awareness of the environmental issues and problems and to find means and ways "to defend and improve the environment for present and future generations" have been referred in the Module. Special mention has been made of the Tbilisi Conference held in 1977 which has made 41 specific recommendations to provide the basic framework for planning and development of EE at all levels. In the light of these recommendations, strategies were formulated to design and develop training courses in EE for pre-service and in-service teachers so that they may acquire necessary competencies in Environmental Education and incorporate environmental dimensions successfully in their teaching.

The broad objectives of the present module which is meant for second-

dary school social science teachers are to acquaint them with (a) the need, goals, objectives and guiding principles of EE and (b) the components of effective teaching/learning process in EE i.e. the content, methodology, instructional materials and evaluation which together will help them in developing the required competencies.

The contents of the module include a detailed discussion on various components of the environment under two broad categories viz biophysical and socio-cultural. The interrelations and interdependence between various components of the environment has been presented with a view to provide a comprehensive view to the readers.

Environmental problems have been viewed from various angles and have been discussed at length. As it would appear, these problems relate mainly to : (a) the deterioration in the quality and quantity of several resources like the soil, forest, wildlife, water etc., (b) environment borne diseases—such as malaria, Bilharzia; (c) chemical pollution caused by chemicals like drugs, fertilizer, pesticides etc; and (d) physical disruption like noise pollution.

While analysing each set of problems, their causes and consequences have been dealt with separately. In the end collective preventive measures have been discussed.

A model of instruction has been given which is self explanatory. Pre-assessment exercise will help the teacher in getting an idea of the level of environmental awareness among the groups of students and in arousing the interest of students in environment and allied matters. On the given pattern, different kinds of exercises may be prepared for different groups.

The problem solving method has been adjudged most appropriate for teaching EE. It involves two techniques—discussion and the project techniques. Various steps of both techniques have been presented in a diagram. Each of these techniques could use some or all the teaching methods as given below.

1. The lecture method.
2. Outdoor exhibiton methods.

3. Methods of autonomous student or group investigation, evaluation and action planning.
4. Effective education methods geared to wards value clarification.
5. Audio-visual aids to supplement all the above methods like films, photographs etc.
6. Instructional simulation and games.
7. Community resource use.

In the end, evaluation serves as feedback for the teachers and students alike to show whether learning has taken place. The teacher can then reinforce or change the methods he was using.

A number of activities have been suggested to facilitate the teaching and learning of various Environmental dimension in the Secondary School Social Science subjects.

SUITABILITY OF THE MODULE FOR ADAPTATION

The social aspects of the environment have been dealt in the Module in a very general manner and it does not focus attention on social components which effect the environment. The Module can be adapted in participating countries after modifying it to reflect social needs including the historical, geo-graphical, socio-economic and socio-cultural events of the past and present which have led to the present day environment.

1) Format

1. The Module needs reorganisation in its format and content. For example, the history and philosophy of EE should be included in the introduction or treated as a separate chapter in the beginning. General introduction may also suggest hints for the effective implementation of the module. The international, inter-governmental and national efforts to improve the quality of life and quality of environment is to be made clear.

2. Introduction to each chapter should briefly mention its scope and sequence which will enable the reader to understand the content. For example, the chapter on suggested activities and experiments abruptly starts with activity itself.

2. Content

1. Though the module is meant for inservice training of social science teachers and supervisors, it is loaded with science content and thereby diffusing the focus on those components of the environment which are related to social sciences.
2. Regarding the essential knowledge about the environment for secondary school social science teachers a holistic view of the biotic and abiotic components may be given in simple and clear terms avoiding the complex, ambiguous jargon. Wherever scientific technical terms are to be necessarily given they should be properly explained for quick understanding of the phenomena. The content should be developed in a logical sequence and not abruptly as has been done on pages 21-25. Perhaps the example of other Module of in-service training prepared under the series should serve as a guide to build up the content knowledge in this Module. Suitable illustrations and figures may be given to illustrate the key concepts of environment.
3. As the social science teacher will deal with EE relevant to social science subject it is essential that he should be capable of dealing with it efficiently. To fulfil this aspect the following two chapters, similar to 2 and 3 in Module III, should be added.
 - i) Social science education, an essential contribution to EE.
 - ii) Curriculum Tasks in EE for social science teachers. This may include :
 - a) Identifying environmental problem.
 - b) Commencing an investigation into an environmental problem.

- c) Preparing and elaborating on possible solutions.
 - d) Do I want to get involved ?
 - e) Identifying possible strategy for social action.
 - f) Evaluation of social action.
 - g) A social action plan future.
4. The Unit on essential knowledge about the problems of the environment and means and ways of their solution is well begun and attempts to classify the environmental problems. But it fails to establish clearly the linkages of the environmental problems in the context of social factors covered in social science teaching. The philosophical, historical, social, economical, developmental, geographical, cultural and religious implications of the environmental problems are to be lucidly brought out.
 5. The Section 3(c) on (page 89-104) deals with History, Philosophy, Goals and objectives and guiding principles of EE. It is felt that this is mostly a repetition of the content given in Sections 3(a) and (b). It is suggested that the ideas presented in Section 3(c) may be incorporated in Section 3(a) and (b).
 6. The teaching methods suggested under Section 3(f) are general in nature. Most of the examples given to explain various methods pertain to the discipline on Science and it is felt that a social science teacher may fail to incorporate these ideas in his teaching. While adapting the Module examples drawn from social sciences pertaining to local environment may be included.
 7. In Section 3(g) some experiments and activities have been suggested for facilitating teaching and learning of environmental dimensions of secondary school social science subjects. The group had following observations :
 - i) These activities can serve as a good guide to develop simi-

lar activities based on local environmental problems for the adapted version.

- ii) Some of the activities pertain to science concepts. These may be modified to give them a social bias.
 - iii) Activities at serial number V to XV on pages 137 to 161 have been arranged in descending order. This may be corrected.
8. The content of Section 3(h) on evaluation in Environmental Education deals with basic principles of evaluation in a very general way. It neither includes specific guidelines and steps for evaluation in EE nor gives any suggestions regarding evaluation of social science components as a part of EE.
 9. The Chapter on Strategies for planning, development and implementation of EE, suggested models of curriculum development may be included for the information of curriculum planners, designers and teachers on the modalities of implementation and evaluation.
 10. The strategies for in-service training of social science teachers have not been included in the Module. The participating countries may include a Section on Strategies for inservice training while adapting the Module.

SUGGESTED MODALITIES OF ACTION FOR LOCAL ADAPTATION

Afghanistan

1. The Department of Teacher Training, Curriculum Development of the Ministry of Education and Universities may be involved to develop on adapted version of the Module.
2. Department of Teacher Training could classify the in-service teachers in social sciences in different categories depending on their subject background, professional training and experience. On the basis of the adapted version of the Module, the Depart-

ment of Teacher Training could develop suitable in-service training programmes for different categories of teachers.

3. Training of the resource persons and the training of the teachers and supervisors may be taken up by Department of Teacher Training and Teacher Training Institutes.

Bangladesh

1. National Institute of Educational Extensions, Administration and Research (NIEEAR) may be assigned the responsibility of developing adapted version of the Module in local language.
2. NIEEAR with the help of Institute of Education of Dhaka University may train the key persons or resource team drawn from 10 Teachers Training Colleges who in turn may organize the inservice training course for the secondary school teachers, Unesco could be requested to support and finance the project in the beginning.
3. The Government agencies dealing with environment and its problems should also be associated with the preparation of the local version of the Module as well as the training.

Sri Lanka

1. The Module can be adapted only when the redrafted version (as per suggestions in this report) is made available.
2. The redrafted version will be revised for adaptation in Sri Lanka to suit local conditions.
3. The same modalities as in Module 2 will have to be followed for implementation.

India

The following strategies may be adopted :

1. The Module needs an extensive modification before being adapted. The procedure similar to that suggested for adaptation of

Modules I and II may be followed for developing adapted version of Module VI.

2. A strategy for training social science teachers in EE should be developed and included in the Module. While infusing the EE content in social science subjects, science based EE content needs to be given only as supplemental and related with the environmental content of social sciences like geography, economics, history, sociology and civics etc.

SUGGESTIONS ON MODALITIES OF ACTION FOR LOCAL ADAPTATION

In a plenary session held on March 15, the participants discussed the modalities for adaptation of training modules in the participating countries and suggested the following :

1. National level seminar of teacher educators, teachers and environmentalists should be organised to discuss the suitability of the modules for teacher training and the implications for implementation. If necessary the modules as such may be translated into the national language for a clearer understanding. Unesco may be requested to sponsor such national seminars.
2. There should be coordination between the various governmental and non-governmental agencies dealing with various aspects of environment and environmental education.
3. The modules should be adapted and translated incorporating local data and information however the global concerns should also be stressed alongside. Collaboration of the organisation mentioned in (2) will be necessary for this. More than one version may be made for try out if necessary.
4. A try-out of the adapted versions should be carried out. This should be done as a collaborative project between a teacher training institution and an educational research centre and a curriculum development centre. The try-out of the pre-service modules will be at the teacher training institution and the

in-service ones at the other centres. The Project will be of two years duration. Unesco may be requested to provide funds for the try out which include printing of the experimental adapted versions.

5. The results of the try-out should be discussed at a national seminar of educational planners, teacher educators and teachers. This seminar should also formulate future plans for wide scale use of the modules if the try-out proves to be successful. This seminar may also be sponsored by Unesco.
6. In order to share the experiences of the participating countries the results of the national try-outs of the adapted versions should be discussed at the sub-regional level. Such a seminar may be sponsored by Unesco.

INSTITUTIONS IDENTIFIED FOR ADAPTATION OF THE MODULES (COUNTRYWISE)

Afghanistan

1. Teacher Training Department, Ministry of Education.
2. Science Centre, Ministry of Education.
3. Curriculum Development Centre, Ministry of Education.

Bangladesh

1. National Institute of Education, Extension Administration and Research, Dhaka.
2. Academy for Fundamental Education, Myemon Singh.

Sri Lanka

1. Planning and Research Unit, Ministry of Education,

India

1. National Council of Educational Research and Training, NCERT.
2. State Council of Educational Research and Training, SCERT.
3. State Institute of Science Education, SISE.
4. Teacher Training Institutions, TTI's.

**SUPPLEMENTARY MATERIALS REQUIRED FOR THE TEACHER
TRAINING PROGRAMMES USING THESE MODULES**

1. Documentation of resource materials available within the country, e.g. booklets, charts, posters, data, slides, films etc. including source from which they may be obtained. The work of collecting and disseminating this may be entrusted to a national institution conceded with education.
2. Unesco may compile and disseminate such information at the sub-regional level.
3. Self-learning modules for primary and secondary level teachers should be developed on a series of topics such as air pollution, energy crisis, soil erosion, etc. The modules should include content, data (both local and global), activities and evaluation items. It should also point out the linkages of the topic under consideration to various subjects and indicate how to integrate the topic in the subject teaching.
4. Multimedia package for teacher training should be developed. This should include slide tapes, video tapes, slides, charts, flash cards, picture stories and films on local environmental problems etc.
5. Development of a resource book of activities including problem oriented projects.
6. Development of a kit based on the resource book/activities in the teacher training materials.

APPENDIX-I

Inaugural Address

Dr. T.N. Khoshoo,
Secretary,
Department of Environment,
Govt. of India.
New Delhi

The environment is a vast and all pervasive entity about which our knowledge is only rudimentary. We are all learning about the environment. It is, therefore, possible that in our endeavour to understand and solve the problems related to EE, we might commit some mistakes here and there. We should, in fact, learn from our mistakes. Ultimately, the correct approach would evolve—in this process of learning the students could be our best guides because it is they who would point out the shortcomings at every step of our curriculum development, teaching processes and evaluation mechanism.

One of the objectives of EE should be to develop among the youngsters a respect for the environment they live in. Environmental problems have emerged as a consequence of man's ever increasing interference with nature from the beginning of civilization. At the dawn of civilization, man was totally dependent on nature and that is why we find that respect for nature has been a part of all cultures. This is especially true in the context of the social culture in this country. Today's civilization, however, is in danger as a result of indiscriminate exploitation of nature and its resources by man through centuries.

Understanding the environment and its problems is not as easy as it appears to be because larger number of factors operating in nature, affect,

and in turn are affected by one another. Development, in the modern context, has almost always gone on with deforestation and progress has become synonymous with pollution. Five broad components or elements of nature essential for supporting life in any part of the globe are air, water, land and the flora and fauna of that region. These components are not independent of each other. When one species of animal becomes extinct, the existence of ten or fifteen more species is threatened. Thus an interference with any one element of nature may affect one or all other components in many ways. Many of these interrelations and interactions are still not clear to us. It is time, therefore, that in all our decisions we must take into cognizance this lack of understanding about the environment.

The environmental problems in India and the adjoining regions, are mainly due to poverty and ignorance as opposed to those of the developed countries where greed for enjoying more and more comforts and luxuries at the cost of nature and its resources has led to the present consequences. For example in our country a poor man in a village has no option but to cut wood from the forest in order to cook his food. In the developed countries, on the other hand, the demand for wood, at times, may have been created artificially, say for a new design in furniture.

Ahimsa as preached by Gandhiji, also meant non-violence towards nature—its plants and animals, worship of nature is a part of almost all religions. In order to be effective, any programme on EE should, therefore, take into consideration the religious, cultural and other social practices.

The educationists, especially the teachers and teacher educators have to play an important role in deciding not only about the content of the EE, but also in developing the methods of transferring it to the pupils in the most appropriate manner. For example the immediate surrounding of a child is his environment which varies in different groups. The environment may vary for different groups of children and therefore the content of environment have to be local specific. The transfer of knowledge should not be limited to the formal systems. Deliberate efforts to exploit all possible means from mass media to religious preachers. The religious preachers can be the most effective agents to spread the message to the masses compared to any other media. However, this will have to be done

very carefully so that there are no chances of preaching scientifically inaccurate ideas and undesirable values.

The Department of Environment, Government of India is engaged in a variety of activities and Programmes some of which are directly linked with school education. These activities include organization of eco-camps in collaboration with Ministry of Education, essay competitions for children in collaboration with United Schools Organisation, India, and, efforts to create awareness about the nature and evolution of life on earth through Natural History Museums in States. The proposal for setting up of *Paryavaran Kendras* (Environment Centres) in different regions where children could come and take up small activities relating to environmental problems is another major programme proposed to be taken up in the near future. However, a single agency like the Department of Environment alone cannot achieve much. It has therefore to be a corporate action so that the cumulative efforts of all agencies and individuals may lead to an environmentally conscious citizen. As the children of today are the citizens of tomorrow, and proper EE programme for them should be our first priority. Hence in this context, the training at schools becomes most crucial.

The training of the teachers should be one of the most important components in the whole scheme of Environmental Education and the curriculum development should centre around the local specific needs of the child. Proper teaching aids should also be developed. This workshop is an important step in the right direction. The main emphasis should, however, be on developing scientifically accurate and valid materials written in a very simple language.

APPENDIX-II

Welcome Address

G.R. Ghosh
Head of the Department
DESM, NCERT
New Delhi-110016

The two-week Unesco sponsored subregional workshop on teacher training in Environmental Education from March 3-16, 1983 is being organised by the National Council of Educational Research and Training, New Delhi. The Department of Education in Science and Mathematics in collaboration with Department of Teacher Education and Department of Education in Social Sciences and Humanities is organising this workshop.

I, on behalf of NCERT, cordially welcome Dr T.N. Khoshoo, Secretary to the Govt. of India, Department of Environment, who has kindly consented to deliver the inaugural address. I extend my warm welcome to Dr. Abdul Ghafoor, Unesco Representative from Paris, who is with us for the entire workshop. I have also great pleasure in welcoming and introducing our participants who have come from neighbouring countries Afghanistan, Bangla Desh and Sri Lanka.

1. Mr. Aminullah Amin, Director, Student Affairs in Teacher Training Department, Kabul, Afghanistan.
2. Mr. Md. Ismail Hossain, Asstt. Prof. Khulna Teacher's Training College, Khulna, Bangladesh.
3. Mr. M.P.W. Fernando, Inservice, Advisors Science Education Department, Field Studies Centre Unit, Ministry of Education, Kalutara, Sri Lanka.

and also

1. Mr. K. Ravi, Faculty Incharge, Environmental Planning School of Planning, Navrangpura, Ahmedabad-9.
2. Miss. K. Vasudeva, Principal, Govt. Co-Education Teacher Training Institute, Daryaganj, New Delhi.
3. Dr. S. Srivastava, Deva Samaj College of Education for women, Ferozepur City (Punjab).

I also welcome the guests and all my colleagues who have spared their valuable time to come and attend this inaugural function.

1. Conservation of Environment is an integral part of India's *Cultural heritage*. We have been taught to conserve nature through customs, myths, traditions and religion.

Let me go back to the days of Ashoka the great Indian Emperor during the 3rd century (273-232) BC. In the Rock edicts at Dhauli, near Bhubaneswar, Orissa, Emperor Ashoka has given the Royal Command to follow certain practices which eventually would lead to Environmental preservation. Thus trees were to be planted along road sides and city avenues, medicinal herbs were to be grown in every home and slaughtering animals were restricted to the bare minimum. These laws were enacted not only for the masses but also in the royal precincts.

In recorded history this is probably the *first* governmental directive towards Environmental Protection. But in spite of these ethical teachings, till today we took all natural assets—air, water, land, flora & fauna for granted and exploited them as liked. We have now come to a stage when we suddenly realise that our own lives are imperilled on this glorious planet of ours. Conservation of natural resources has become a global issue and Concern. All well-wishers of humanity must be concerned about this global malady. I would like to highlight the major directives in this line :

The history of conservation movement in India is less than 30 years. The movement started with the setting of the *Indian Board for Wild Life* in 1952. It is during the late sixties that the *world ecology* made its

appearance on the Indian scene. Among the government sectors the government of Gujarat was the first to set up *The State Council of Ecology*. Hon'ble Minister Digvijay Singh was the *chairman*. Among the private sectors, the first Scientific Institution set up was WANKANER Ecologica. Foundation in 1971.

Real land mark was set, when Govt. of India constituted the *Advisory* body "*National Committee on Environmental Planning and Co-ordination*" (NCEP) under the aegis of the Planning Commission.

Dr. Pitambar Pant—was its first Chairman. The main aim of the letting up of this committee was a prelude to the *U.N. Conference on Human Environment* which took place in Stockholm in 1972. Prime Minister Smt. Indira Gandhi led the Indian delegation and gave the key note address.

At the 12th meeting of the Indian Board for wild-life several important recommendations were made. One of them related to the inclusion of wild life in syllabi of *Nature Study*, *Biology* and *Zoology* taught in the Schools. In the matter of inclusion of wild life in the syllabi of schools ; it was suggested that follow up action should be taken on the recommendations made by the sub-committee headed by Dr. P.N. Luthra through *State Education Departments, NCERT and UGC*.

In the year 1979, Constitutional amendments were made to include *Forest and wild life* in the *Concurrent list*. An important event took place in 1980 when Prime Minister set up a 14-member expert committee headed by the then Minister of Planning *Mr. N.D. Tiwari*.

On the 15th September, 1980, Tiwari Committee submitted its report *recommending legislative measures and administrative machinery for ensuring Environmental Protection*.

The Committee pointed out *three areas* of Concern :

1. Threatened species of FLORA & FAUNA.
2. Pollution of AIR, WATER & LAND—and their protection from industrial effluents.

3. Improvement of Condition of Human settlement. The Tiwari Committee recommended that :

“A sound, well informed interest in Nature among our people needs to be cultivated. Nature education at levels of education and public communication must be efficiently organised especially in our schools”.

The Committee also recommended for the setting up a *Deptt. of Environment*. This department was officially set up in Nov. 1980 and its first Secretary was Dr. S.Z. Qasim. Dr. T.N. Khoshoo took over from him. On March 12, 1981 *Parliamentary Environment Forum*—in a line with other voluntary Forums such as Farmers' Forum, Science Forum etc.—was formed taking a step forward.

Secretary to the Govt. of India, Ministry of Education and Culture convened a meeting of the NCERT and UGC officials in April, 1981 to review (a) action so far taken in regard to the inclusion of Wild Life (flora and fauna) in school/college syllabi (b) propose plan of action for inclusion of such topics in school/college syllabi (c) Orientation in *teacher training* to include these aspects. NCERT submitted a note informing that in the new instructional material, prepared by the NCERT there is a considerable emphasis on making teaching learning of science (including wild life, forest conservation), social sciences and humanities more environment oriented and socially relevant.

During December 16—30, 1981 an International Conference on EE was held in Delhi to emphasise the present needs. NCERT participated in a big way and contributed two booklets :—

- 1) Environmental Education at the School Level. A lead paper.
- 2) Environmental Education and NCERT.

The lead paper has three sections. The first section, while dealing with the emerging trends in EE, starts by describing the Vedic period. It then describes, in the international context the emergence of EE as a *distinct entity* in the 1970s. The guiding principles, the definitions of

EE and the alternative models for patterning the EE curriculum are next attempted to project the *multi/inter disciplinary*, approach drawing on the specific content of each discipline in making a holistic and balanced perspective. At the end of the section the status of EE in the National Context is given.

The second section deals with implications and the third section states very briefly the future perspectives of EE.

The second booklet lists all the publications related to EE contributed by the NCERT academic staff members.

As Convenor and Coordinator for EE at the NCERT level I realized that the Environment and Environmental Concerns are assuming critical importance both at the individual as well as the National Level. In view of this in April 1980 it was proposed that an *Internal Advisory Committee* and a *High Level Expert Committee* on EE be created at the NCERT. I am happy to announce that both the committees have been constituted during 1982. These Committees will handle all matters related to EE at the School Level and will also look after the associated Teachers Training Component. For creating public opinion the *First National Conference of Legislators* was held in New Delhi during 30th April—1st May, 1982, Smt. Indra Gandhi inaugurated it.

Of the 23 resolutions passed by the Conference the 16th one stated : "The present educational system be so oriented that the educational Curricula (formal and non formal) help in prompting Environmental Consciousness among students starting from pre-school to secondary state and also adult education." I happen to be one of the members who drafted the resolutions. The 15th resolution stressed on *value orientation* pertaining to the social component—for bringing in Environmental awareness among people at large.

The Conference strongly advocated that the Department of Environment be immediately accorded the status of a Ministry to make it more effective in the implementation of various programmes. The Ministry of Environment was then formed in 1982. In August 1982 Ministry of Agriculture convened a meeting to discuss "*Social Forestry Programme*"—which

is the point no. 12 of the New 20-point programme. General suggestions were made regarding action to be taken by NCERT, these include ; preparation of a *film* on 'afforestation', 'afforestation be definitely included as a *Compulsory* activity for all students, creation of nursery in the schools and *training of key personnel* in this regard, *teachers training Courses* may give special emphasis on afforestation tree plantation be included as an essential activity carrying weightage under Socially Useful Productive Work and schools should adopt stretches of land along school side road for this purpose. The Govt. of India while considering recommendations of various Committees decided finally that "the lead responsibility may be assigned to the Department of Environment for providing the inputs of EE, the responsibility for dissemination of EE would be that of the Department of Education". Thus a closer linkage is necessary to be established between the Department of Environment and the Ministry of Education specially its organisations like NCERT, UGC, Department of Adult Education etc. "Accordingly the Hon'ble Minister, Department of Environment; Sri Digvijay Singh convened a meeting on 17-2-83 in his chamber to discuss the issue. Secretary, Department of Environment, Dr. T.N. Khoshoo, Secretary, Ministry of Education Mrs. S. Grewal, Joint Secretary, Ministry of Education, Mr. S. Satyam, Joint Director NCERT, Dr. T.N. Dhar, myself as the Focal point officer and secretary UGC participated in this meeting. On the first instant it was felt necessary to find out a status report on EE at the school level of various states. Other issues raised were, increase in *study load books*, *teaching aids*, availability of trained teachers, and MODULES for teacher training programmes.

I emphasised in the meeting and again repeat here that EE is not nature study, not conservation education, nor it is ecology as such. EE is a philosophy with a holistic approach, it is issue oriented, focussing on problems solving through students' ACTIVITIES. If it is understood and taught properly the teaching load will not increase. The main task is orientation of teachers and the key personnels who will handle the situation. We are thankful to Unesco for giving us this opportunity of trying out the MODULES for preparation of right kind of teachers. We take it as our privilage to have been able to handle these materials with experts from abroad and within the country.

These Pre-service and In-service Teachers Training Modules have been

prepared by Unesco. Module I & III are for Pre-Service while Nos. II, IV & VII are for the In-service teachers. The objectives are to (i) familiarise teacher educators with the contents of the modules (ii) to explore efficient and economic ways for local adaptation and use of these modules, (iii) to identify institutions in the participating member States for this purpose and (iv) to exchange information and experience in the development of EE in the subregion and States.

I once again welcome you all to this workshop and look forward to participating with you faithfully.

APPENDIX-III

Statement For the Opening Session

Abdul Ghafoor
Programme Specialist
ED/STE, Unesco
Paris

Ladies and Gentlemen,

It is a pleasure for me to welcome you on behalf of Unesco to the Sub-regional Workshop on Teacher Training in Environmental Education. This workshop is convened by the National Council of Educational Research and Training (NCERT) of India, under contract in the context of Unesco's Approved Programme and Budget for 1981-83 and an activity of the Unesco-UNEP International Environmental Education Programme of the Division of Science, Technical and Vocational Education.

Recommendation 96 of the Stockholm Conference called on "the organizations of the UN system, especially Unesco(to) take the necessary steps to establish an international programme in environmental education, interdisciplinary in approach, in-school and out-of school, encompassing all levels of education and directed towards the general public....."

In response, Unesco and UNEP—jointly established the current International Environmental Education Programme (IIEP). The initial three-year phase of the Programme culminated in the World's first ministerial level intergovernmental Conference on Environmental Education,

which was organized by Unesco in cooperation with UNEP, in Tbilisi, USSR, in October 1977. Its Declaration and Recommendations constitute the framework, principles and guidelines for environmental education at all levels—local, national, regional and international—and for all age groups both inside and outside the formal school system.

Concerning personnel training in environmental education, the Tbilisi Conference stated that "the training of qualified personnel was considered to be a priority activity. This holds good for both initial and in-service training, for the purpose of familiarizing teachers in formal education, organizers in non-formal activities for young people and adults, administrative personnel and educational planners and researchers with environment—linked subject matter and educational and methodological guidelines.

The conference further emphasized "the establishment at the national level of programmes of action, with aim, on the one hand of familiarizing teachers and educational administrators and planners with different aspects and problems of the environment, and on the other hand, of giving them a basis of training which would enable them to incorporate environmental education effectively into their respective activities. This action should take the form of both pre-service and in-service training." In particular, the Conference underlined the following aspects of teacher training in environmental education :

- environmental sciences and environmental education should be included in curricula for pre-service teacher education ;
- the staff of teacher education institutions should be assisted in this respect ;
- teachers should get environmental training relating to ;
- the area, either urban or rural, where they are going to work;
- Member States should take the necessary steps to make in-service training of teachers in environmental education available to all who need it ;

- the implementation and development of in-service training including practical training, in environmental education should be made in close co-operation with professional organizations of teachers, both at the international and national levels ;
- education and training institutions should have the necessary flexibility to enable them, to include appropriate aspects of environmental education within existing curricula and to create new environmental curricula that meet the requirements of an interdisciplinary approach and methodology ;
- teachers and learners should be involved in the preparation and adaptation of instructional materials for environmental education ;
- teachers in training should be given an understanding of as wide a range as possible of educational materials and aids, with special reference to low-cost materials and opportunities for adaption and improvisation in local circumstances.

Mr. Chairman, .

I should like to add that in terms of strategies, Unesco has endeavoured through regional, subregional and national training workshops to foster the development of strategies for curriculum development and teacher training to indicate how environmental dimension could best permeate all subjects, collectively or separately, depending on the subjects and on the school level, with due consideration to the established pattern of education, crowded curricula and subjects at each level, and the established pattern of teaching methods. In this context, teacher training strategies ought to be based on curriculum development strategies at different educational levels. It has also been emphasized that strategies developed ought to be realistic in view of their financial implications because costly undertakings will not be convincing educational enterprises, especially in developing countries.

I should like to add that Unesco, among numerous activities for the development of environmental education, has also undertaken the preparation and dissemination of a series of experimental modules for the incorporation of environmental dimension into pre. and in-service training of primary and secondary school teachers and supervisors. Specifically, teachers trained through these modules are expected to :

- increase their environmental awareness, sensitivity to and consciousness about the environment and its problems particularly the local environment and the changes occurring therein ;
- develop an awareness and appreciation of the need importance, goals and objectives, and guiding principles of environmental education ;
- acquire essential knowledge about the environment and its problems particularly those relating to the local environment ;
- realize the totality of the environment as a fundamental base for interdisciplinarity among school subjects ;
- develop competence in the use of methodologies most appropriate to the teaching of the environmental dimension of school subjects, and in particular the problem-solving method ;
- develop skills in designing and using activities and experiments essential and motivating for the learning and teaching of the environmental dimension of school subjects ;
- acquire competence in the development and preparation of environmentally oriented lesson plan and in the use of evaluation techniques and methodologies to assess the learning of students, and the effectiveness of instruction ;
- get acquainted with alternative strategies for planning, developing, implementing, managing and evaluating curricula in environmental education.

The above mentioned series of modules for the pre-service and in-service training of primary school teachers, secondary school science teachers and secondary school social studies teachers in environmental education has been prepared in the context of Unesco—UNEP International Environmental Education Programme, Division of science, technical and Vocational Education, and as a follow-up to Tbilisi Conference Recommendations with respect to the training of teachers in environmental education. These modules have been prepared in collaboration with NCERT, India ; School of Education of the University of West Indies in Jamaica ; School of Education of Monash University in Australia ; the Science centre of the University of the Philippines ; and the Kenya Science Teachers College.

Each of the above modules has been prepared through a process which has accommodated the experiences of a number of professionals and teacher training institutions in its preparation and revisions towards a final version. For example, the fundamental objectives, outline, method of preparation as well as the co-ordination of revisions have been carried out by Unesco in Paris. The outlines were sent out to a number of institutions for comments and they were revised in the light of their critiques and comments. The preparation of each module was contracted with the above mentioned institutions which required development of a 20-page detailed outline for Unesco consultation on the basis of which the first draft was prepared. Each draft was sent out by Unesco to about 30 teacher educators—around the world for comments and critiques which are used for its revision. Three of the draft modules now at your disposal have been revised 2 or 3 times and the other two are the first drafts which are to be circulated for comments and critiques towards their final versions.

The next step in this process is the adaptation of the modules to local environmental situations and to the needs and academic level of trainees by interested teacher education institutions. I may add that even at the draft level, the adaptation of one module has already been undertaken by the United Schools International in India and the Bahrain National Commission for Unesco and the Regional Office of United Schools International for the Arab Region.

It is envisaged that this action could lead to the precipitation of a teacher training programme in environmental education in the institutions involved and also to the final revision of the modules which could be published and widely disseminated to teacher education institutions which, on the basis of their needs and priorities, may select or adapt all or part of these modules for their education systems.

It is in the context of this important activity that this Subregional Workshop on Teacher Training in Environmental Education has been organised with the following objectives :

1. To familiarize teacher educators with the contents of the series of teacher training modules in environmental education prepared by Unesco.
2. To explore efficient and economic ways for the local adaptation and use of teacher training modules.
3. To explore possibilities and identify institutions for local adaptation of the teacher training modules in the participating Member States.
4. To exchange information and experience in the development of environmental education in the subregion.

Mr. Chairman,

Ladies and Gentlemen,

As mentioned, the training of teachers in environmental education is one of the priorities of the Unesco—UNEP International Environmental Education Programme and this is one of the important workshop that Unesco has supported on this topic. Unesco is grateful to the Director and personnel of NCERT, and the Government of India for their efforts in preparation and organization of this Workshop which we hope will contribute to the promotion and development of teacher training in Environmental Education.

APPENDIX-IV

Presentation on Unesco-UNEP International Environmental Education Programme

Abdul Ghafoor
Programme Specialist ED/STE,
Unesco, Paris :

Environment is considered to be natural systems, both physical and biological, and social systems, such as socioeconomics, cultural resources and public health. Current literature with respect to development and the environment is indicative of special emphasis on environmentally sound development. It envisages to use the environment for the benefit and well being of humanity in such a way that the gains from the environment should not have a short-term objective (time and population-wise), it should not disturb environmentally governing laws such as ecological principles, it should not result in unnecessary waste, it should consider the continuous re-utilization of waste (by products and the processing of natural elements such as water for cooling purposes), it should not lead to final products and wastes which are harmful to human health and to the balance of nature, etc. Such aspects or guidelines of development with respect to the environment ought to be considered when developing energy, agriculture, technology, mining industry, food industry, cosmetics, pharmaceutical products, synthetic textiles for human needs, housing projects, urban enterprises etc. In the development of the environment, not only man's physical and material needs ought to be considered as basic criteria, but man's ethical, moral, spiritual and cultural values, in

which he finds the serenity of life, should receive the deserved attention as well. The 70s may be considered a decade of the environment because in view of the major environmental problems concerning energy and mineral resources, terrestrial ecosystems, water resources, ocean and coastal systems, human settlements, natural and manmade disasters, major international, regional and national activities for establishing guidelines and strategies for the protection and improvement of the environment at all levels have been witnessed. Among these numerous international activities, of the seventies, those undertaken by the United Nations system are the United Nations Conference on Human Environment (Stockholm 1972), Human Settlements (Vancouver, 1976) Water (Mar del Plata, 1977), Desertification (Nairobi 1977) the Intergovernmental Conference on Environmental Education (Tbilisi, 1977), and the Conference on Science and Technology (Vienna, 1979).

The eighties may be considered an important period for the implementation of the guidelines, strategies and recommendation of the above mentioned conferences with regard to the protection and improvement of the environment, especially through the incorporation of environmental education as a common denominator into the whole process of formal and non-formal education. In other words, the incorporation of environmental education into all educational levels, and in particular into the training of personnel and curriculum and materials development for formal and non-formal education can be considered one of the major educational changes that would challenge educators in the 80s.

In this context the Unesco-UNEP International Environmental Education Programme was put into operation in 1975 to promote reflection and action, as well as international co-operation in the field of environmental education in response to Recommendation 95 of the United Nations Conference on the Human Environment.

The aims and priorities of the Unesco-UNEP International Environmental Education Programme are the following :

- To develop, refine and establish the theory, principles and applications of environmental education as a dimension of knowledge and experience ;
- to integrate environmental education into existing educational

systems, programmes and procedures for both the formal and non-formal categories, taking into account the needs of urban and rural populations ;

- to develop and support programme in education to generate environmental awareness at policy and decision-making levels in the public and private sectors and in consideration of all aspects of development;
- to assist governments in the establishment of systems which will include the environmental dimension in educational policies, programmes and projects ;
- to promote and support the pre-and in-service training of environmental education personnel ;
- to encourage the development of educational resources, instructional materials and audiovisual aids for the purposes of environmental education ;
- to promote and support research, experimentation and appropriate evaluation procedures in environmental education ;
- to establish a system of information exchange and dissemination.

Major activities that the Unesco-UNEP International Environmental Education Programme has undertaken in the areas of exchange of information, research and experimentation, training of personnel, and curriculum and materials development may be summarized as the following :

I. Exchange of Information

1. *Connect* :

A quarterly newsletter, it is prepared, printed and disseminated in English, French, Spanish, Arabic and Russian.

2. *Directory of Environmental Education Institutions* : (second version) ; printed and distributed in English, French and Spanish,

3. *Directory and Environmental Education Project and Activities* : Prepared and to be printed and disseminated in English, French and Spanish in 1983.
4. *Directory of Environmental Education Periodicals* : Prepared and printed in English, French, Spanish and Russian in 1981.
5. *Annotated Bibliography in Environmental Education* (second version) : printed and distributed in English, French and Spanish in 1979-1980.
6. *Thesaurus of Environmental Education Terms* : Prepared and to be printed and disseminated in English, French and Spanish in 1983.
7. *Computerised Data Base on Environmental Education* : has been developed.
8. *Reinforcement of Documentation Services* : Publications and documents in environmental education have been identified and acquired for the Unesco Headquarters and Regional Offices.

II : Research and Experimentation :

1. Studies on environmental education :
 - (i) Study on the Utilization of Modern Approaches in Environmental Education (prepared and edited in 1980-81, to be printed in 1983).
 - (ii) Guide on the Use of Gaming and Simulation for Environmental Education (prepared and edited in 1980-1982, in press).
 - (iii) Guide on Approaches and Methods for the Evaluation of

Environmental Education Projects (prepared in 1981-1982, to be edited and printed in 1983).

- (iv) Guide on Pedagogical Approaches for the Environmental Education of Rural Educators.
- (v) Case studies on Coordination Mechanisms for the Development of National Environmental Education Programmes (prepared in 1981, to be published in *connect* in 1983).

2. Surveys on Environmental Education

- (i) *Needs and Priorities in Environmental Education, 1975.*
- (ii) *Survey on Progress and Trends in Environmental Education since the Tbilisi Conference* (to be printed in 1983).
- (iii) *Survey on Teacher Training in Environmental Education* (to be printed in 1983).
- (iv) *Survey on Curriculum Development in Environmental Education* (to be printed in 1983).

3. Research Projects in Environmental Education

- (i) Analysis of Curricula of Polytechnical schools for the incorporation of Environmental Dimension into the Different Disciplines in (Bulgaria 1981-1983).
- (ii) Comprehensive study of Interdisciplinary Contents and Methods for the Incorporation of environmental Dimension into Biology and Geography Studies in Poland (1981-1983).
- (iii) Analysis of Curricula for the Incorporation of Environmental Dimension Australia, (1981-1983).

4. Pilot Projects in Environmental Education :

- (i) Pilot Project on Environmental Education for Teachers and Pupils Related to Problems of Tropical Humid Zones, Costa Rica (1979-1981).
- (ii) Pilot Project for Rural Populations, Colombia, 1978-1979.
- (iii) Pilot Project for Rural Schools and the General Public, Guatemala, 1977-1980.
- (iv) Pilot Project in Methodologies for Secondary Schools, France, 1976-1978.
- (v) Pilot Project for Primary Schools in Marginal Urban Settlements, Peru, 1976-1979.
- (vi) Pilot Project for the General Public, Mongolia, 1978-79.
- (vii) Pilot Project for Primary Schools and the General Public, Jordan, 1978-1980.
- (viii) Pilot Project for Secondary Schools and the General Public, Ukrainian, USSR, 1977-1979.
- (ix) Pilot Project of an Environmental Education Network for Secondary Schools, U.S.A., 1976-1977.
- (x) Pilot Project for Primary Level Teachers, Ghana, 1977-1980.
- (xi) Pilot Project for Secondary School Teachers, United Kingdom, 1977-1980.
- (xii) Pilot Project for Primary Schools, Afghanistan, 1977-1980.
- (xiii) Pilot Project for Primary Schools and the General Public, Indonesia, 1977-1980.

- (xiv) Pilot Project for Primary Schools, India, 1979-1980.
- (xv) Pilot Project for Secondary Schools, Kenya, 1978-1981.
- (xvi) Pilot Project for Youth Associations and Clubs, Egypt, 1978-1981.
- (xvii) Pilot Project for Primary School Teachers and the General Public, Costa Rica, 1979-1981.
- (xviii) Pilot Project for Primary and Secondary Schools, Peru, 1979-1981.
- (xix) Pilot Project, in the Sahel Region, Senegal, 1977-1982.
- (xx) Pilot Project for Primary School Teachers and the General Public, Dominican Republic, 1979-1982.
- (xxi) Pilot Project for Secondary Schools and the General Public, Yugoslavia, 1979-1982.
- (xxii) Pilot Project on Environmental Education for Teachers and Pupils Related to Preparedness for earthquake Risks, Peru, 1978-1981.
- (xxiii) Pilot Project on Environmental Education for Teachers, pupils and the General Public Related to Preparedness for Cyclone Risks Dominican Republic, 1979-1982.
- (xxiv) Pilot Project on Environmental Education for Teachers and Pupils on Desertification, Upper Volta, 1979-83.
- (xxv) Experimental Environmental Education Project for the School System, Czechoslovakia. 1979-1983.
- (xxvi) Pilot Project on Formal Environmental Education related to problems of the Caribbean Environment, Cuba, 1981-1983.

- (xxviii) Pilot Project on Environmental Education for the General Public on Problems of Urban Marginal Areas, India, 1981-1983.

III. Contents and Materials for Environmental Education.

1. *Trends in Environmental Education*, 1977.
2. *Environmental Education in the light of the Tbilisi Conference* 1980.
3. *Teachers Guide in Environmental Education* : To be published in December, 1983.
4. *Sourcebook in Environmental Education* : To be published in 1983.
5. *Sourcebook in Non-formal Environmental Education* : Under preparation in 1983.
6. *Glossary in Environmental Education* : To be published in 1983.
7. *Experimental Module on Environmental Problems in Cities* : In press.
8. *Experimental Module on the Use and Conservation of Natural Resources* : To be printed in 1983.
9. *Experimental Module on Desertification* : To be printed in 1983.
10. *Experimental Module on Health, Nutrition and the Environment* : To be printed in 1983.
11. *Manual of the Rational Use of Energy* : To be edited in 1983.

12. *Environmental Education Audiovisual Package for Adults* :
To be printed in 1983—first version.
13. *Environmental Education : Module for pre-Service Training of Primary School Teachers and Supervisors*. To be published in 1983.
14. *Environmental Education : Module for In-Service Training of Primary School Teachers and Supervisors* : To be printed in 1983.
15. *Environmental Education : Module for Pre-Service Training of Science Teachers and Supervisors for Secondary Schools* :
To be printed in 1983.
16. *Environmental Education : Module for In-service Training of Science Teachers and Supervisors for the Secondary Schools* :
To be published in 1983.
17. *Environmental Education : Module for Pre-service Training of Social Studies Teachers and Supervisors for Secondary Schools* : To be printed in 1983.
18. *Environmental Education Module for In-service Training of Social Studies Teachers and Supervisors for Secondary Schools* : To be printed in 1983.

IV. Training of Personnel in Environmental Education :

1. A series of national training workshops in environmental education for key personnel such as teacher educators, curriculum developers, educational planners, school supervisors and administrators have been undertaken with the following objectives ;
 - To increase awareness and knowledge of the participants about the environment and its problems ;

- to acquaint participants with the goals, objectives, principles and teaching methodologies in environmental education ;
- to determine some of the urgent needs and priorities in environmental education at the National level ;
- to establish strategies for the development of curriculum and teacher education (pre-service and in-service) in environmental education at the national level.

a) National training workshops prepared and organised :

- (i) Brazil (26-31 March 1979).
- (ii) Cuba (28-30 March 1979).
- (iii) The Philippines (26-31 May 1979).
- (iv) Bulgaria (4-8 June 1979).
- (v) Chile (8-11 August 1979).
- (vi) Korea (11-15 December 1979).
- (vii) UpperVolta (17-20 December 1979).
- (viii) Lebanon (January 1980).
- (ix) Argentina (23-28 June 1980).
- (x) Senegal (1980).
- (xi) Poland (2-11 September 1980).
- (xii) Central African Republic (25-28 November 1980).
- (xiii) Bangladesh (24-28 February 1981).
- (xiv) Jamaica (3-5 March 1981).
- (xv) Ukrainian SSR (7-10 April 1981).

- (xvi) Guyana (4-8 May and 18-20 May 1981).
- (xvii) Sierra Leone (13-17 December 1981).
- (xviii) Hungary (2-4 December 1981).
- (xix) China (14-30 April 1982).
- (xx) Egypt (20-31 August 1982).
- (xxi) Rwanda (29 August—4 September 1982).
- (xxii) Ecuador (25-30 October 1982).

b) National training workshops under preparation which will be organised in 1983.

- (i) Sri Lanka ; (ii) USSR ; (iii) Ethiopia ; (iv) Eyelorussian SSR ; (v) Sudan ; (vi) Nepal ; (vii) Ivory Coast ; (viii) Zaire ; (ix) Benin ; (x) Guinea-Bissau ; (xi) Malta ; (xii) Malawi ; (xiii) Tunisia.

2. Subregional training workshops in environmental education for key personnel.

1) Subregional training workshops prepared and organized ;

- (i) Subregional training workshop in environmental education for the Caribbean, 9-20 June 1980, Antigua.

- (ii) Subregional workshop on teacher training in environmental education in Europe, 13-17 October 1980. Prague, Czechoslovakia.

2) Subregional workshop prepared which will be organized in 1983.

- (i) Subregional workshop on teacher training in Environmental Education, 3-16 March 1983, New Delhi, India.

- (ii) Subregional workshop on teacher training in environmental education, July, 1983, Kingston, Jamaica.
3. Regional training workshops in environmental education for key personnel were organized with the following objectives :
- to develop strategies at the national level for :
establishing environmental education programme ;
 - curriculum development and teaching-learning materials preparation in environmental education for primary and secondary schools and teacher education institutions ;
 - training of teachers in environmental education for primary and secondary schools and teacher education institutions through pre-service teacher education;
 - to promote the exchange of information with respect to programme formulation, teaching-learning materials preparation and teacher training in environmental education.
- 1) Regional training workshops prepared and organized :
- (i) Regional training workshop in environmental education for Africa, 11-20 December, 1978, Dakar, Senegal.
 - (ii) Regional training workshop on environmental education for Latin America, 29 October—7 November 1979, San Jose, Costa Rica.
 - (iii) Regional training workshop on environmental education for Asia, 22-29 September 1980, Bangkok, Thailand.
 - (iv) Regional workshop on environmental education for Europe, 8-12 December 1980, Essen, Federal Republic of Germany.
 - (v) Regional training workshop on environmental education for the Arab States, Bahrain, 12-19 May 1981.

4. International training course in environmental education for key personnel from developing countries prepared and organized :
 - (i) International training course in environmental education, Prague, Czechoslovakia, 1-28 September, 1982.
5. Final reports and working documents prepared and distributed for subregional, regional and international training workshops :
 - (i) Strategies for developing an environmental education curriculum, 1980.
 - (ii) Strategies for the training of teachers in environmental education, 1980.
 - (iii) Strategies for developing a national strategy for environmental education—a planning and management Process, 1980.
 - (iv) Discussion guide, regional workshop in environmental education in Europe, Essen, Federal Republic of Germany, 8-12 December, 1980.
 - (v) National reports, regional workshop on environmental education in Europe, Essen, Federal Republic of Germany, 8-12 December, 1980.
 - (vi) "Environmental Education in Asia and the Pacific", Bulletin of the Unesco Regional Office for Education in Asia and the Pacific, June, 1981.
 - (vii) Strategies for Curriculum and Materials Development in Environmental Education for Primary and Secondary Schools in the Caribbean, 1980 (working paper for the Antigua workshop).
 - (viii) Strategies for the Training of Teacher in Environmental

Education for Primary and Secondary Schools and Teacher Education Institutions in the Caribbean, 1980.

(Working paper for the Antigua workshop).

- (ix) Model of Pre-graduate Training of Teachers of General Education Subjects for Environmental Education of Institutions of Higher Education, 1980 (working paper for the prague workshop.)
- (x) Model of Complementary and In-service Training.
- (xi) Final Report, Regional Training Workshop in Environmental Education for Asia, Bangkok, Thailand, 22-29 September 1980.
- (xii) Final Report, Regional Training Workshop in Environmental Education for Africa, Dakar, Senegal, 11-20 December, 1978.
- (xiii) Final Report, Regional workshop in Environmental Education for Europe, Essen, Federal Republic of Germany, 8-12 December, 1980.
- (xiv) Final Report, Training Workshop in Environmental Education San Jose, Costa Rica, 20 October—7 November 1979. This report has been translated into English and circulated as well.
- (xv) Final Report, Subregional Workshop on Environmental Education for the Caribbean, Antigua, 9-20 June 1980. This report has been translated into Spanish and circulated too.
- (xvi) Final Report, Subregional Workshop on Teacher Training for Environmental Education, Prague-Hluboka, Czechoslovakia, 13-17 October, 1980.
- (xvii) Final Report, Regional Training Workshop on Environmental Education in the Arab States, Manama, Bahrain, 12-19 May 1981.

(xviii) Lectures on Environmental Education for the International Training course, Prague, Czechoslovakia, 1-28 September, 1982.

6. Local adaptation of teacher training modules in environmental education.

(i) The adaptation to local environmental situations, to the needs and academic level of in-service teachers, the testing through a workshop, evaluation, revision, local reproduction and distribution of the Environmental Education Module for In-service Training of Science Teachers and Supervisors for Secondary Schools was undertaken in 1981 and would be completed in 1983 in India. The same module is under adaptation in Bahrain.

V. An international workshop on environmental education was organized in 1975 in Belgrade, Yugoslavia.

VI. Five regional expert meetings in environmental education were convened during 1976-77 in Asia, Africa, the Arab States, Latin America and Europe.

VII. The first intergovernment conference on environmental education was organized by Unesco in co-operation with UNEP in Tbilisi, USSR, in October, 1977.

VIII. The International Expert Meeting on Progress and Trends in Environmental Education since the Tbilisi Conference was organized by Unesco in Paris in September 1982.

IX. Support to conferences and meetings for the participants of developing countries.

1. Conferences and meetings organized :

(i) International conference on environmental education, New Delhi, India, 16-20 December, 1981.

(ii) Regional conference on environmental education transfers in ASEAN Universities, Serdang, Malaysia, 18-21 August, 1981.

- (iii) Conference of the International Union of Biological Sciences, Canada, 1982.

X. International seminar prepared and organized :

International seminar on Environmental Education Interdisciplinarity, Budapest, Hungary, 10-14 November, 1980.

XI. List of surported meetings in 1983.

1. "World Environmental Education Conference," Cairo, Egypt, early 1983.
2. "Symposium on Long-term Development of Environmental Policy and Environmental Education in Europe." Vienna, Austria, 9-11 June, 1983.
3. "Regional Seminar on Environmental Education at University Level", Budapest, Hungary, October 1983.
4. "International Symposium to Review ways and Means of Incorporating the Environmental Dimension into School Curricula and Teacher Education", Bulgaria, October, 1983.

APPENDIX-V

Valedictory Address

Mrs. S. Grewal,
Secretary, Govt. of India,
Ministry of Education and
Culture.

Friends,

I am very happy to be with you all this afternoon for the valedictory function. We appreciate the assistance that the Unesco has extended for organising this workshop which has afforded our experts the opportunity to exchange experience with their counterparts from other countries. What is more important is that it has helped us to look critically at the approaches that we have adopted and the materials that we have developed. We are particularly grateful to the Unesco for providing us the opportunity to profit from Dr. Ghafoor's valuable and expert guidance.

2. The need to promote awareness of the environment, and its significance for mankind's very survival, hardly needs any emphasis. Application of science and technology for short term gain and without concern for long term consequences has often played havoc with our environment. Factories belching smoke have polluted the air that we breathe. Industrial and other wastes dumped into rivers and seas is endangering our marine life. The indiscriminate felling of trees has brought about climatic changes and led to soil erosion and soil slippages. Women's craze for furs and man's primordial desire for adventure have led to extinction of many species of wild life. In this process, the ecological balance which nature maintains to make worth living, is being seriously disturbed.

3. In poor countries, pollution of the physical environment is combined with the pollution of the social environment. Large masses suffer from deprivation of various kinds. In urban slums people live in unhygienic conditions and fall prey to disease and vices of all kinds. For even the basic necessities of life are not available, compelling them to live almost subhuman existence. In many of our villages, availability of clean drinking water is severely limited. This, coupled with lack of understanding of the methods of disposing off waste, has led to large scale morbidity, reducing severely the chances of human survival particularly of children.

4. It is true that in most low income countries, it is poverty which forces people to live sub human existence. It also compels their indulgence in operations which disrupt ecological balance. Cutting of trees to meet the requirements, of individual households is an illustration of the inability of the poor to obtain alternative sources of energy. Many have to resort to poaching to meet their subsistence needs. These are hard realities and can not be brushed aside as some affluent people tend to do. It is no use asking a poor tribal not to gather wood from the forest or kill animal life indiscriminately. Unless alternative sources of providing them a decent living are thought of and made available, people will, in their struggle for existence, resort to practices which pose grave danger to the environment.

5. At the same time, advances in science and technology have now made available means which can allow people to live a decent life, without polluting and degrading the environment or without destroying environmental resources. The gobar gas, which provides an alternative source of energy for the villages is a case in point. Similarly energy of the wind can be used to operate pump sets for irrigation. What is needed is to inform people of these and other low cost and locally available technology and train them in the skills that are required.

6. It also needed to be recognized that man's awareness, understanding and effort can alter the sub-human conditions in which many in the low income countries live. Even the existing resources can be put to better use and substantially improve the average man's quality of life. Control of morbidity and infant mortality can be achieved substantially by adoption of hygienic practices which do not cost large financial resources.

Locally available foods can be properly cooked provided in a large

measure, the nutritional elements that families require. The application and utilization of immunisation facilities which have now become available, can provide the necessary safeguards against the crippling effects of such diseases as poliomyelitis. The more innovative methods of disposing of waste can not only provide alternative energy sources but also increase productivity of our land. What is needed is the generation of an awareness of what is already available in the environment and how it can be utilized for mankind's advantage.

7. The growing population also affects adversely the quality of our environment and the quality of life. Means to reduce the rate of population growth are now available. In recent years, there has been increasing adoption of these practices. There is still a lot to do to make people, particularly in rural areas to see the link that exist between unchecked growth of population and the life of large scale deprivation. The awareness of this relationship can be created through education. I am glad that through our population education project, we are creating this awareness in the generation which will take upon the burden of governing and building this nation.

8. Education is too often narrowly conceived as mere imparting of instruction according to a prescribed syllabus in order to prepare students for an examination. While good instruction is an important aspect of education, there are other aspects which need to be appreciated. Thus, in a good school, apart from instruction, there should be various kinds of activities to enable children to absorb from the atmosphere in the school some other kinds of understanding, skill, interests, attitudes and, values which go to improve the human personality.

9. One of the aspects of learning in school which I would like to emphasise is the development of sensitivity about the world outside the school. It can be done if the school curriculum provides for experiences which promote an understanding of the nature which is so bountiful and beautiful in our country. I would like to quote our Prime Minister in this context because she has been most concerned about proper value orientation in our education. I quote her ;

“ I do not suggest that we should develop newly structured course and curricula but that we should introduce a new orien-

tation to learning processes and attitudes. For example, an awareness of the environment and the need for conserving basic life support systems like soil, water, flora and fauna, and the need for population stabilisation, and family planning etc., should grow naturally into the student from the young age. Since opinions are usually formed in the formative years of one's life, teaching aids, methods, and open-door field visits should be so structured that living in harmony with the environment becomes a habit with each young individual.

10. It is important that teachers are sensitised towards these requirements so that they are able to properly guide the teaching/learning process.

11. The effort at environmental education is a concrete step that we have taken. In many ways, India has been one of the few nations which have made positive efforts to provide in its education system substantial elements of environmental education. I would like to take this opportunity to particularly congratulate NCERT for developing a systematic approach. The approach is to incorporate in the curriculum and textbooks content which helps in knowing about the environment.

12. In the prevailing system, it is impossible to think of education without referring to textbooks. Textbooks are a major medium of providing knowledge to children. It is, therefore, necessary that every attempt is made to ensure that they do not contain material which are prejudicial to promotion of a sense of harmony with nature. It is in this context that we have been expressing concern about some of the textbooks containing passages which may directly or indirectly militate against a proper understanding of and a constructive attitude towards the totality of the natural environment. It will be necessary for us not only to identify such offensive passages and remove them but also to put in appropriate positive passages, relating to environmental protection, wild life preservation, social forestry, etc.

13. NCERT is also engaged in developing textual materials—both for formal schools and non-formal education centres—which are based on

the physical and social environment of the specific communities. This has substantially contributed in making instructional programme more relevant and meaningful.

14. The provision of environment related materials in syllabi and textbooks has to be coupled with a systematic programme of training teachers to deal with various concepts and materials adequately. It is important that teachers are fully committed to this basic cause. Unless they had that internal spark, all our external reforms are not likely to be very meaningful. Orientation of teachers, preparation of instructional materials for preservice training programmes, and orientation of teachers who are already in service have to be given urgent attention. Unless teachers believe in the values we cherish and want our children to learn, they will not be able to impart them to the students with any conviction.

15. Teachers have also to be trained to use the environment as a rich learning resource. NCERT is in collaboration with such State level institutions as SCERTs, SIEs, etc. organizing orientation training of teacher educators and resource persons. At State levels also systematic effort to orient teachers to "environmental studies" has been initiated. I am sure that these efforts will generate awareness about environment and the need to preserve it and also the competence to deal with the problems that unwise use of environment has created.

16. And towards this end we must use the large amount of media facilities available with us—not only for creating awareness amongst students, teachers and the community in general, but also about the need for protecting and preserving the environment and how they could help in this national cause. A concerted effort must be made to use radio and television for this purpose. Programmes on environmental education should be broadcast regularly as they are bound to make some impact. The teachers must collaborate with the broadcasting authorities and help them in producing such programmes.

17. I am glad that the Unesco asked us to organize this sub-regional workshop. I am sure that our faculty has been able to place before their counterparts from other countries another experience in deve-

loping a programme of environmental education. I hope that this experience has been mutually beneficial. I also hope that this sub-regional workshop has opened up further vistas of fruitful collaboration. On behalf of the Ministry of Education and Culture and also of NCERT. I can assure the participants from other countries and the Unesco of our readiness to provide all the assistances that we are capable of.

18. Once again I would like to thank all of you for giving me the opportunity of being with you this afternoon. I hope you will carry forward the work that you have initiated. I wish you all success in your endeavour to make this world a more pleasant one to live in.

APPENDIX-VI

Country Report

Democratic, Republic of Afghanistan
Presented by Aminullah Amin

Increasing problems of environment are faced by most of the countries in the world and require urgent measures to reverse the trends. These problems vary according to economic conditions, scientific development, technology and different ways of production. Problems and difficulties, therefore, appear in different shapes and kinds.

In developed countries where the agricultural, economic and industrial production increased without taking care of the needs of the people, these problems are more serious. Considerable amounts of agricultural, industrial and mineral production carry very hard effects like pollution of water, air, agricultural fields and other natural resources and cause irreparable damages. The problems which appear in such countries are existence of poisoned chemical materials, cancer incidence caused from atomic explosions and atomic furnaces, poisoned smoke from factories and automobiles, etc. which produce a range of health hazards.

There are some countries where exploitation of nature has remained within people's needs where it is easy to control these problems.

In under-developed countries these problems are manifested in different shapes like: Agricultural soil erosion, deforestation, extinction of wild life, lack of potable water, the energy crisis and related issues, poor

health and sanitation, social and family problems, inadequate housing and population growth.

With regard to the above problems the role of environmental education in improving the environment is essential and important. Environmental education including, training research and information dissemination is the indispensable means for both short-term and long-term solutions.

The main and important goal of environmental education is to develop a world population that is aware of, and concerned about the environment and its associated problems, and which has the knowledge skills, attitudes, motivation and commitment to work individually and collectively towards solving the current problems and the prevention of new ones.

The Government of the Democratic Republic of Afghanistan is in the process of consolidation in order to establish a developmental system most suited to the people. In new system of education which is introduced all the school curriculum is revised in such a manner that it is adopted not only in school grades, but at the same time in the teacher training institutions and while working out this revised curriculum the importance of environmental education as an integral part of general education has been fully recognized. The education decision makers in the Democratic Republic of Afghanistan are seriously searching for ways and means to introduce environmental studies at all grade levels in most of the subject areas, respective age group of children and condition of local environment.

Background Information

Democratic Republic of Afghanistan is a mountainous country in the middle of Asia. To the north of Afghanistan is USSR, to the west is Iran, Pakistan to the south and Kashmir and China to the east. Afghanistan is a land-locked country, it has a total area of approximately 700,000 square kilometers, a population of 17 million.

From northeast to southwest, Afghanistan is divided by mountain ranges including Hindu Kush and the Pamir, with elevations of upto 7600 metres.

The country's rivers are mostly snow-fed. They receive precipitation during winter and early spring discharge a maximum amount of water during the months of April and May causing frequent floods.

Afghanistan with most of her territories spread over mountain slopes and cut by gorges and deep valleys is a land of beautiful scenery and different climates. It has four seasons, spring and autumn are rainy and wet, summer is hot and dry, and during the winter it is cold and all country is full of snow.

The people of Afghanistan are from Aryan race. Among its people, the pashtoon are the largest group, 60 per cent of the total population are pashtoon and 5 per cent are Hazara, Uzbek, Arab Turkish, Mangole, etc. Ninety-five per cent of the people are Muslims. Pashto and Dari are official and National languages of Afghanistan.

Afghanistan has, behind it, a long and glorious past and it was the centre of ancient civilization for centuries. It was here that two of the great religious movements of the world, Brahmanism and Zoroastrianism took their origin and two great literary movements came into being. The history of Aryans begins with settlement of the Aryans in Bakhter some five thousand years B.C. At the beginning of 8th century the Muslim troops conquered northern and western parts of Afghanistan and spread Islamic religion in these parts.

Eighty per cent of the people are engaged in agriculture on traditional systems and in livestock production. Afghanistan is also rich in minerals and other natural resources.

Education

The modern and formal education was introduced in Afghanistan at the time of King Shir Ali Khan in the year 1868. He established some primary level schools in place of private local Mosque schools.

In 1905 the First secondary school was opened, in 1919 at the time of King Amanullah, after the third Anglo-Afghan war, Afghanistan obtained her political independence, and modern education was improved

and developed. Many primary and secondary schools for boys and girls were established, a large number of students, both boys and girls were sent abroad for higher education. In 1932 the University of Kabul was established. The pattern of school system was 6+3+3. During 1975, however, in a sweeping education reform it was changed to 8+4 cycle with 8 years compulsory primary education and four years secondary education. In reality though, not much efforts were visible towards implementing primary education as compulsory.

After the victory of Saur Revolution and establishment of the Revolutionary Government in April 1978, the Basic lines of the Revolutionary Duties of the Government of the Democratic Republic of Afghanistan, under items 19, 20 and 21 state :

1. Ensuring of Universal, compulsory and primary education to the children of school age (without regard to race, language, religion or sex), and creation of essential provision for effective struggle against illiteracy.
2. Expansion of free intermediate, high and vocational education in order to train academic and professional of the country and review of curricula of the school and other institution.
3. Creation of a progressive national cultural system and as a First step, ensuring of conditions essential for evaluation of arts and literature, education and publication in the mother tongues of tribes and nationalities resident in Afghanistan. According to the new education system the structure now is :

(a) Pre-school

- (i) Nurseries (3 months to 3 years)
- (ii) Kindergartens (3 years to 6 years)

(b) Primary education grades 1 to 4 (age 7-13 years)

(c) Incomplete middle school grade 5-8 (1-8)

(d) Complete middle school grade 9-10 (1-10)

(e) Intensification of vocational education during the latter part of the complete Middle school education.

The pattern is : 4+4+2.

Education in Afghanistan from per-school up to University is free and highly centralized.

As explained above, a new ten-year schooling cycle is being introduced against the present 12 year cycle. This switch-over has been planned in appropriate phases.

With more than 95 per cent illiteracy in the country and the education system hardly developed, not much can be said about environmental education duly recognises the importance.

Major Environmental Problems

Major environmental problems of the country could be summarized as follows :

1. Macro Kinds

- a. Soil erosion
- b. Extinction of wild life
- c. Deforestation
- d. Lack of potable water
- e. The energy crisis and related issue

2. Micro Kinds

- a. Poor health and sanitation
- b. Social and family problems
- c. Inadequate housing
- d. Population growth in almost every family

Current formal and non-formal environmental education programme objectives approaches to implementation. Results obtained and problems encountered

As above, after the Saur Revolution especially after the successful second phase of the Saur Revolution Afghanistan has now turned the cor-

ner so far as the fundamental pre-requisite for development is concerned—the installation of a government dedicated to development—and the importance of proper education for the overall socio-economic development in the country has been duly recognized.

In the light of the new directives the curriculum development for general education is centralised under the Department of Compilation and Translation of the Ministry of Education. This ensures full coherence of the curricula for the primary and secondary level education. The department also coordinates syllabus of general subject in technical and vocational education at the secondary level.

While formulating new curriculum for all the grades the progressive government of the day fully realized the importance of Nutrition, health education and ecology and environmental education at various levels, since it is very important that everybody in the country knows about his environment and takes care of the same.

While working out the revised curriculum the importance of environmental education as an integral part of general education has been fully recognized. While there is no legislation on this subject so far, the education decision-makers, in the Democratic Republic of Afghanistan, are seriously searching for ways and means to introduce environmental studies at all grade levels in most of the subjects in a manner appropriate to each subject area, respective age group of the children and condition of the local environment. There is no separate subject under the name for environmental education but some significant headway in this direction has been made as, for instance, in the introduction of health education, in agriculture and science education in primary and secondary level.

Before applying the environment education curricula in primary and secondary schools a pilot project for the prime purpose of infusing aspect of environment education into science education was initiated.

Along with the introduction of health education a major subject in primary level, a significant step was made with the development and implementation of a pilot project in Environmental Education for grade 7 students in 1979. The task of its implementation in schools situated in ecologically different provinces of Afganistan was given to the National Science Center. The project, which lasted one year, covered students in grade 7 in six

different provinces of the country. The total cost of 35000 dollars was shared by National Government and Unesco.

The aim of the project was to teach students to become ecological minded, and to understand the inter-relationship of human and their immediate environment.

The project was at the stage of trial-testing. Environmental education was introduced to students of grade 7 as a separate subject in the form of self-learning modules. The activities included simple, practical and safe experiments, lectures, study-tours and field trips.

Before adopting the curriculum a survey of various provinces was conducted. Also the secondary schools teachers were invited to a workshop to point out their experience for the curriculum of this course. In term of teaching materials a guide book for teachers was also developed. The modules, together with teachers' guide, were then mass-produced and introduced to students and teachers through a trial-testing which lasted for two months. To ensure successful implementation of the project a seminar was conducted in the National Science Centre and about 40 teachers and science supervisors and experienced people from outside the Ministry of Education participated. The result from this pilot project were considered very satisfactory and encouraging.

The topics which were chosen for this pilot project were :

First chapter

- Soil erosion (General information)
- Forest conservation
- Wild life conservation

Second chapter

- Environmental hygiene
- Problems of environment hygiene
- Food and hygiene
- Preservation of food
- Diseases, venereal diseases

- Prevalence of diseases
- Control of diseases
- Population—growth
- Environmental pollution
- Water pollution
- Air pollution
- Automobile emission and noise

The introduction of environment education in revised curriculum of primary and middle school education was linked with the subjects like health education, agriculture, science and practical work. The curriculum includes :

- Different seasons in Afghanistan, animals, plants, men activities, ways of protecting body in different seasons of the year.
- The Nature and its role in the life of the people (mountains, hills, rivers, plains, forests etc.).
- Minerals—for construction (granites, sand and soil lime stone)
- Mineral Fuel oil, natural gas, coal etc.).
- Iron ore
- Mineral salt
- Structure of the human body
- Water, the importance of water to the life
- Animal, plants, conservation of water
- Preservation of wild life
- Soil, kinds of soil (sand soil, clay soil loam)
- Conservation of the soil
- The importance of fertilizers in the soil
- Animals and plants and their environments.

Besides introducing the environmental education in current formal education through schools, the other formal current education is literacy courses. By means of literacy courses we introduced environmental education to farmer, worker, housewives and in mass-media according to their interest and professions, for example to farmers what soil, preservation

of soil, using chemical fertilizers, alternation in sowing etc. or to mass-protecting themselves from disease.

The ecology and environmental education is also introduced to the people by non-formal education.

1. Rural Development Project

Rural development project programme have been established to strengthen the economic condition of rural people. Through these programmes efforts have been made to increase rural peoples knowledge, to raise their standard of living and to promote their welfare. The main objectives of the rural development are to show rural people better ways of living, to solve their problems related to economic, social, agricultural, health, environment and education.

2. Radio and Television

Radio and T.V. of the Democratic Republic of Afghanistan is an effective agent of education. It broadcasts a large number of educational programmes at different levels for people living in both urban and rural areas. The programmes are most useful in areas where formal education has not reached the people.

Radio and T.V. of Afghanistan broadcasts a series of educational programmes to enlighten and train people informally, and includes educational, social, economic, health, agriculture, scientific and environment topics.

These programmes fall into following categories :

1. The village, home and agriculture
2. Family life
3. Health programme
4. Agriculture and animal husbandary programme
5. Women and new life
6. We and our country
7. Radio Doctor
8. Morning special gift programme
9. Youth programme
10. Family planning

11. Science knowledge
12. Children programme
13. Our country
14. Our listeners

The main objective of these programmes is to enlighten people indirectly and make them aware of social, economic and environmental problems.

Another Radio and T.V. programme cover agriculture and rural development which includes materials on poultry, as also farmers' questions and answer section.

3. Family Planning Project

The development of science and technology has had many effects on health, medical practice and social affairs, some of these effects have caused problems. This project provides information on child health and nutrition, guidance attempts to make families sensitive to their responsibilities towards their children's education and physical and mental health. To instruct parents how to arrange and plan family affairs assistance is given in the implementation of these instructions.

4. Agricultural Cooperation

By means of agricultural cooperatives the farmers are educated in their respective work.

The main purpose of these projects is to encourage farmers to work cooperatively with each other. By means of this programme, educational programme, technical programme, guidance in the improvement of seeds, the functional literacy and environmental education will be provided to farmers.

The objectives in terms of environmental education are :

1. To help individuals and social groups acquire awareness to total environment and its allied problems
2. To become more ecological minded
3. To understand the inter-relationship of human and their immediate environment.

All the above factors should emphasize that there is growing recognition for environmental education at every level. Since the country is in the process of consolidation after recently liberating from feudal structures, it is too early to evaluate these programmes. There are certainly numerous difficulties in implementation as would every development of education systems would naturally face. Large-scale foreign assistance would also be necessary in implementation of plans. More important, at the moment is the awareness of environment which does exist in abundance.

Future Plan for the Development of Formal and Non-Formal Environmental Education

The pilot project described above and also implementation of new curriculum in primary and secondary level of schools especially in topics of soil conservation forest conservation, wild-life conservation, community of health and safe drinking water, has given a valuable experience to those responsible for curriculum development to apply and strengthen the environmental programme. Also government decided to train professional teachers, to teach this curricula successfully and fruitfully, to children and adults. Also it is planned that the curriculum development department responsible to prepare books teaching aids, teachers' guide line for this purpose, and introduce the new materials and curriculum by educational seminars in different provinces.

For implementation of the above programme, regional help will also be needed in identifying, planning, execution and evaluation of such projects in terms of sharing experience. Since our experience in this field is limited, for further development of this programme, advisory as well as financial assistance would be necessary. The United Nation Environment Programme (UNEP) and Unesco, we hope, would be able to strengthen their assistance for such least developed countries.

Teacher Training

There are 14 teacher training institutes throughout the country. In the past the pre-service teacher training was based on :

—Kindergarten level teacher training (13-14) grades primary level

teacher training (13-14) grades for grades 1 to 8 primary of the old system.

—Bachelor degree course (13-16) grades run by the Kabul University for the secondary level—Lycee of the old system.

After the Saur Revolution, with the introduction of new curriculum in primary schools, it has become necessary to reorient the teacher training programmes and improve its quality, revising and upgrading the preservice teacher training curriculum in keeping with new school curriculum.

At present according to the new system and new curriculum of schools, teacher training department train teachers as follows :

1. Training teachers for kindergarten—two year programme (13-14) grades.
2. Training teachers for primary level—two year programme (13-14) grades.
3. Training teachers for middle schools and secondary level—two year (13-14) and four year (13-14-15-16) grades.
4. Training teachers teacher training institutes (i.e. teacher educators at the level of Master Degree—two years programme (17, 18) grades.

The new curriculum and teaching plan and teachers' guide prepared for all above levels by the professional members and teachers of teacher training departments and applied to all teacher training institutions.

In the new curriculum relating to primary curriculum subjects like health education, agriculture, home economics have also been introduced in teacher training curriculum. In terms of environmental education and training primary schools under the subject of health education, agriculture, science and practical arts the following items are included in the teacher training curriculum.

1. In science curriculum for 13 and 14 grades :

1. Plants

2. Fruits
3. Vegetables
4. Animals
5. Soil
6. Forest

2. Health Education

- Aims and objectives of health education
- Food, proteins, oil, carbohydrates, minerals, vitamins etc.
- Disease and protection from them
- Human body
- Anatomy and physiology

3. Teacher Training curriculum consists of a separate stream for training teachers for literacy courses also.

Teachers who graduate from teacher training institutions are able to teach professionally the subjects including health, agriculture and ecology and environment in primary, secondary and informal education.

Side by side the pre-service Teacher Training department has responsibility to train teachers in their in-service courses.

There are two types of in-service courses for teachers

A. Up—grading and up—dating courses

These courses are for those teachers who have graduated from 12 grade. They are following regularly courses like the pre-service students, both academic and professional subjects. These are part time courses.

B. Up—dating courses :

These are short-term courses conducted during the school holidays for up-dating teachers professionally and for learning new methods in teaching.

Conclusion

Afghanistan does not, yet, suffer from as many environmental problems as the other industrialized countries are facing. The realization of importance of this subject in education has taken place timely. At every level of education and in every subject the importance of environment is and will be highlighted one way or the other. The professionals of the country as well as foreign advisors available to the education sector are working together to develop best-possible strategies. Additional assistance would certainly be a pre-requisite for good results. In the meanwhile other countries actions which have adverse bearing on global environment should be controlled.

APPENDIX-VII

Country Report Bangladesh

Presented by Ismail Hossain

Bangladesh emerged as a new nation after the war of liberation in December, 1971. Since then rebuilding of the destroyed office of education system had been the major concern of the Government. Subsequently, in order to set the national hopes and aspirations government has set up National Education Commission (1974) on the recommendation of which the National Curriculum Committee (1977) completed its task of revising the curricula of Class I to XII, based on the principles of work oriented and people oriented education.

Nation-wide debates were held in 1978 and 1979 under the auspices of the Interm Education Advisory Council out of which a consensus emerged that our education system should be mass and production oriented.

With these objectives and ideas the government undertook a plan of action to revitalise and reorganise the education system linking it with development and progress. Changes to make education purposeful in consonance with the hopes and aspirations of the people have been made. The major targets formulated into concrete development programmes in successive development plans laid great stress on the eradication of illiteracy, introduction of universal primary education, and non formal education for dropouts and adult illiterates, population education environmental education and the strengthening of vocational, technical and science education.

The education system of Bangladesh may be broadly divided into three stages Primary, Secondary and Higher Education.

The administration of primary school is conducted by the Directorate of primary and mass education under the Ministry of Education which has field officers in sub-divisional head-quarters (called primary education districts) and Thana Head quarters. Of the total number of 43,937 primary schools in the country, 36,666 are managed by the government, where as 7,271 are privately managed. The primary education in Government primary schools is free. Secondary Education in Bangladesh may be divided into three stages Junior Secondary, Secondary and Higher Secondary. Education is offered in Secondary schools known as high schools and higher secondary. education is offered in Intermediate colleges and intermediate sections of Degree colleges. Normally a high school comprises five grades i.e. Class V to Class X and intermediate colleges comprises two grades, i.e. Class XI and XII.

The curricula structure is uniform upto Class VII where the basic programme is of general education and there is no public examination upto this grade. Diversification of curriculum is introduced at Class IX where students separate into streams in Science, Commerce, Humanities and Vocational. The academic programme is intended to be terminal at the end of Class X when the students appear at a public examination called Secondary School Certificate (SSC). Primarily the programme is directed to the preparation of student for entrance into the higher secondary stage. Recently government has decided to introduce integrated courses with emphasis on science education at the SSC level.

At the higher secondary stage the academic programme for general education is of two years education (Class XI to XII) with the public examination called Higher Secondary Certificate (HSC) examination at the end of Class XII. Academically all secondary schools and higher secondary colleges are under the control of schools and higher secondary colleges are under the control of the Boards of Secondary and Higher Secondary Education. There are 4 such Boards (one for each administrative division) having their headquarters at Dhaka, Rajshahi, Comilla and Jessore.

Secondary and Higher Secondary Education is administered by the Directorate of Secondary and Higher Secondary Education which has field officers in every division, District and sub-divisions.

Bangladesh is a over whelmingly populated area of the world. The alarming rate of its populated growth has adverse affect on its environment,

For example in order to boost up the food production of country imprudent use of pesticides and chemical fertilizer's has made the soil lose much of its natural qualities, salinity of soil has increased. In some areas the problem has reached it climax. Hitherto soil of Bangladesh was wanted in nitrogen potash and phosphate. Recently deficiency of lime and other components has attained a very critical stage, vast fields of paddy plants dried up before yielding the paddy.

The wholesale use of insecticides has killed many of the useful insects. Not only that the intake of poison through plants, vegetables as food has caused a great threat to public health and life, diseases like cancer, gastro-intestinal trouble, paralysis are becoming more prevalent than ever.

The frequent flood and other natural calamities like cyclone, tornado, tidal bore cause heavy casualties to human lives and poverty. Because of their economic condition people find it hard to rebuild houses again and again. So many people leave villages for the towns. Erosion of agricultural land and houses by rivers is a constant menace in many parts of Bangladesh a land of rivers. When rivers take away the health and homes of the people living on the banks, many of them go to town to try their fortune there. For these reasons there is always an in rush of village people to town. Again, the well to do persons do not like to live in villages lack the amenities and facilities of modern life which are available in towns. Almost all the centres of higher education and culture is in towns. With the introduction of universal primary education, the Government has also adopted adult and non-formal education as the avowed objectives of eradicating illiteracy from about five million illiterates of the country under a pilot project covering eight Thanas.

Adult education centres have been opened which impart literacy to adult men and women and also educate them on environment, agriculture, fisheries cooperatives etc. Textbooks and follow up books have been designed for this purpose which is normally taught by adult education teachers.

Environmental Education has been introduced in Class II to V. The Bangladesh textbook board, NCDC (National Curriculum Development Cell) and NIEEAR (National Institute of Educational Extension Administration and Research) has brought out good books for pupils of these

classes. Preparation is going on to make the future generation aware of the implication of environment and life.

At present the teachers training colleges and primary training institutes do not offer any special training courses on environmental education for secondary and primary teachers.

But they offer training on the methods of teaching, social sciences and general science alongwith other school subjects. On the basis of this they impart lessons on environmental education. It may be mentioned here that environmental education is a very new concept in Bangladesh and it has been introduced only at Primary level from the current year. There is ample scope for incorporating environmental education in general science and social studies both at Primary and Secondary levels. A human child is born, lives, grows and dies in the environment. So his entire being is connected with environment, physical, geographical, social, cultural, economic etc. Education in Bangladesh-like the education in any other part of the world is required to have environmental awareness in order to live properly, befittingly and to conserve and manage environment efficiently.

APPENDIX -VIII

Country Report Sri-Lanka

Presented by
M. P. W. FERNANDO,

Introduction

Environmental topics began to be introduced into the curriculum in keeping with the current trends in the early seventies. The particular subjects chosen were Science, Social Studies, Health Science and Agriculture in the Junior Secondary Curriculum and Botany, Zoology and Agriculture in the Upper Secondary Curriculum. With the introduction of population Education into the junior secondary curriculum through the UNEPA supported Population Education Project in the mid seventies the environmental topics with special emphasis on the population aspects were added. A particular innovation in the environmental education is the work done under the Field Studies Centre Programme of the Ministry of Education. Under this Programme pupils are exposed to real life ecological and environmental situations in forest reserves, lagoons and river bank. These Field Study Centres are sited in or under the environmental resources such as forest reserves lagoons and river banks.

These centres are provided with laboratories, several museums and the necessary lab and audio-visual equipment including overhead projectors, sound slide projectors, T.V. Sets and video recorders and cameras. The pupils and teachers study environmental topics under camp condition at these centres. In Sri Lanka at present there are seven Field Study Centres.

Background information about Sri-Lanka

Sri Lanka has a land area of 65,610 square kilometres (25332 sq. miles). The population at the last census in 1981 was 14850000 giving a population density of 230 per square kilometer (586 per sq. mile) Sri Lanka has 2500 years long national and cultural identity and a continuous written history going back to the foundation of the national and cultural identity and a continuous written history going back to the foundation of the nation in the 6th century B.C. by colonists from North India. These colonists founded settlements in what is called the Dry Zone of the island and by the time Buddhism was introduced in the 3rd century B. C. Sri Lanka was prosperous and popular land. In the centuries following the advent of Buddhism a great civilization arose with large city of Anuradhapura as the capital. The monuments which still exist in this old capital are among the largest in the ancient world. The fact that this civilization supported a large population is evident from the large irrigation works which are still in the service and by the fact that Sri Lanka has no primary forests except in the central high lands, all the land having being cultivated at one time or another.

Owing to invasions from South India. This civilization declined and some of the prosperous settlements abandoned when the capital was shifted to locations in the South. The impact of large scale destruction of forests to grow food for a large population would have caused environmental problems in the past too. It is possible that such effects contributed to the decimation of the population which began in the 13th Century and continued upto the 15th century. Yet in the ancient days the central high lands where the rivers have their sources were left undisturbed. The shifts of the population to the central high lands began in the 16th century. However it was the vast clearing of the high land forests under the British, for the plantation in the 19th and 20th centuries that caused the large scale erosion and other adverse effects of the removal of highland forest cover. The present high population demand the need to open up land for food crops is the cause for concern. However the environmental hazard of forest depletion are now well known. Therefore new developments have taken environmental factors into account. Several environmental authorities now exercise a measure of vigilance to preserve the natural

environment all the way from the mountain reserve in the hills to the ocean teacher. Yet the most certain way to ensure the protection of the environment is through popular education.

Major Environmental Problems of the Country.

Depletion of forest cover owing to necessary clearing of forest to support growing population, because Sri Lanka has a high population Density (230 per sq. km) the pressure on the land is very high. Depletion of the forest cover leads to soil erosion giving way to environmental problems in the locations where forests are cleared and in the down stream areas owing to silting of rivers and canals. There is a likelihood of change of rainfall patterns owing to loss of forest cover.

Coastal erosion in Sri Lanka plays a leading role in environmental problems. The damages done in coral reefs in coastal belt is clearly seen in places like Hikkaduwa and Beruwala.

Pollution of the environment is evidently seen owing to Industrial development. Air and water pollutions due to factory wastes and usage of agro chemical are getting increased. In Sri Lanka this mode of pollution is however confined to small area when compared to the whole country.

Disturbances to ecology by destruction of flora and fauna by more agricultural development is also another environmental problem seen in Sri Lanka.

Environmental education encompasses variety of aspects that touch the life of the individual. Of these for a country depending on imported fuel and fast depleting forests the priority at the turn of this century is energy. A survey in Sri Lanka showed that 94% of the households use firewood for cooking. The sudden explosion of population and the increase in consumption of energy has led to the fast dwindling of the forest. In addition the forests are being destroyed for agricultural expansion, timber etc. The result is that forests are being cut down at a faster rate than it can grow. This put a limitation not only on the traditional source of fuel (firewood) but also on the expansion of hydro power as forests form the water sheds for rivers.

Current Formal and Non Formal Environmental Education Programme

The fact that Environmental Education has gained institutional recognition in Sri Lanka can be explained on the way the Ministry of Education, has treated the study and appreciation of environment as important. The policy coordination branch of the Ministry of Education has two different ways of approach to environmental study, the main programme of which is Field study centre programme. In addition to this, a population education programme works out to link junior secondary curriculum to environmental factors. Through another programme of forming project clubs in schools launched by the Sports and Extra Curricular Branch of Ministry of Education, some aspects of environmental education are studied. These innovations launched by the Ministry of Education are regular programmes which will enrich the study on environmental education. Though there are no regular non formal environmental education programme the Press, Radio and TV present several features to reveal the importance and necessity of appreciation and preservation of the natural environment. In addition to mass media several other state authorities go in line for proper environmental education system. Central environmental authority, Natural aquatic resources agency, Coast Preservation Board Mahawali Development Authority Forest Department, Timber Corporation wild life Department are among them. The competitions organised by the Press, Radio and TV and Annual Environmental Day celebrations are also helping in environmental education in a non formal way. The leading formal programme for environmental education is the Field Studies Centre programme. This innovative programme takes the school going population to real environmental situation. Details of this programme are :

- 1.1 A technique of teaching learning methods in environmental education is tried out in the Field Studies Centres of Sri Lanka where teachers and students are able to study the environmental features on a first hand basis so that they could acquiring knowledge as well as skills and attitudes and develop the environmental studying material at the same time.

This mode of studying has been found to create the required motivation to study science in a meaningful way by utilizing the real life situations.

- 1.2 These study centres also serve as resource centres for environmental studies. Each Centre is build around a natural environmental resource such as a forest, a lagoon, a river bank etc.
- 1.3 In these centres the learning environment is quite different from classrooms and lecture halls and the working times are flexible. Instead of formal classrooms there are workshops museums, libraries, and the open environment. Here teachers work as partners with the students and experts. Field work and discussions help them to up date their knowledge and the scope of learning goes beyond that commonly found in the classroom.

2.0 Study Camps

- 2.1 The study 'Camps' mostly residential because it is essential that these camps should be 'living-in' camps in order to give effectively the trainees the correct motivation and to help to develop attitudes towards such environmental oriented projects.
- 2.2 In these 'living' in camps organised models concerned with the projects are displayed, further ideas about related scientific and technological problems are discussed, developed and tried out. This is a term used in out of school activity where temporary 'living in' takes place with any available facilities and need not necessarily be under tents.

Future plans for development of envrionmental education.

Since the importance and validity of environmental studies are well felt by the Ministry of Education, it is decided to expand the Field Study centre programme to cover a greater area of the island. In white paper proposals for reforms in Centre programme will be widened. From the primary level up to the G.C.E. (Adv. level) the environmental education will be integrated in popular subjects of the curriculum. Since the rate of literacy in Sri Lanka is comparatively high (85%) mass media is to be used in educating people on the importance of keeping real environment.

Suggested priorities in school teachers on environmental education

As environmental education needs more attention by the society, students as well as teachers should be kept well informed. For this environmental education topics should be included in teacher training syllabuses and in-service seminars for teachers. For in-service education, the Field study centres can serve as resource centres for teachers. The Sri Lanka rural environment has plenty of locally available resources in the form of solar energy, wind power and being an agricultural country plenty of bio mass. Traditional rural ways of harnessing heat from firewood and the ways of cooking can be made more efficient if the empirical knowledge underlying those practices can be improved through the use of modern scientific techniques along with rural technology. Recycling of the local resource that are available is another concept that needs scientific approach if the population is to be atleast partially freed from the burden of imported high cost fuel and fast depleting traditional fuel. Development of any country is closely linked with the development of its people. Improving the quality of life is the corner stone of development of any country. The teacher plays a main role in the improvement of quality of life generation.

Conclusion

An important characteristic of linking school curriculum to environment is that it looks at a body of knowledge which is holistic and built up of discipline that are integrated. This knowledge is essential for sustenance of life in this planet and it exists in a particular cultural and socio-economic setting of a country of variations of these within a country. Unlike body of knowledge normally imparted informal education environmental knowledge exists in an unsystematized manner. Further it is not static but changes with time. Thus understanding the science of environmental problems and associated issues would be mainly a life long process and hence the teaching and learning should not only be for those in school (future citizen) but also for those in the community.

APPENDIX-IX

Country Report India

Presented by

K. Vasudeva

K. Ravi

S. Srivastava

Introduction

India has a large population of about 300 million below 17 years of age which constitute about 45 per cent of total population. Leaving aside 125 million pre school children about 50 per cent of the rest are school going reading in 600,000 schools, distributed in 31 States and Union Territories, taught by more than 2 million teachers in 15 different languages (Hindi, Kashmiri, Punjabi, Urdu, Bengali, Assamese, Oriya, Gujarati, Marathi, Telugu, Tamil, Kannada, Malayali, Sanskrit, English).

Education being a subject in the concurrent list of the Indian Constitution both the State and Union Legislature formulate policies and programmes on education.

The Indian population is characterised by horizontal and vertical socio-economic diversities as well as multiplicity of religions and languages. With a rural urban ratio of 80 : 20, more than 50 per cent of its population are below the poverty line.

India, like other developing and developed nations of the globe, bears the scars of violence done to its natural environment. India can least afford to ignore to impart EE to its children.

The time is ripe for introduction of EE in educational systems in the country for, (a) the people at the top level are deeply concerned as well as aware of the importance of EE (b) the expertises in different departments concerned with different facts of environment and environmental problems as well as their solutions are also available. But the main problems are not only collection of information from different sources by the implementing educational agencies for reshaping of curriculum to integrate EE and coordination and participation of concerned agencies and experts in EE implementation but also to form dedicated groups of workers.

Major Environmental Problems

The relevance and importance of environmental conservation is quite rightly expressed in the words of Mrs. Indira Gandhi :

“Environmental crisis which is confronting the world will profoundly alter the future destiny of our planet”

In India environmental problems can be classified into two broad categories :

- 1) The problems arising as a result of abject poverty and under development.
- 2) The problems arising as inherent resultants of the process of development.

The main sectors of relevance to environmental protection in India are :

- 1) Land and water resources.
- 2) Natural living resources.
- 3) Environmental pollution.

In the succeeding paragraphs these problems are discussed along with the measures proposed to solve and prevent them.

Land and water resources

The problem was highlighted by the Prime Minister in her key note

address on the occasion of launching of the world conservation strategy on March 6, 1980. The loss of large forest areas during the last 30 years through deforestation had resulted in soil erosion and floods and also in the silting of reservoirs and river beds and are causing havoc in the river deltas. Restoration of the eco-systems of the Himalayas and other mountain ranges ought to be one of the most immediate tasks.

The Ministry of Agriculture in March 1980 estimated that of the total land area of 304 million hectare (mh) for which records exist as much as 175 mh are having environmental problems. Thus the country is undergoing losses of staggering dimension because of continuing degradation of land resources. The break up for these 175 mh is given below :

Serious water and wind erosion	150.00 mh
Shifting cultivation	3.00 mh
Water logging	6.00 mh
Saline soils	4.50 mh
Alkali soils	2.50 mh
Diara land	2.40 mh
Other culturable waste lands fit for reclamation	6.60 mh

Total	175.00 mh

In order to preserve the integrity of our soil endowments and enhance their productivity most of the States and Union Territories, at the behest of the Government of India, have set up land use Boards. Moreover this year the Government of India has set up a land use commission at the All India level.

Natural living resources

Population explosion and unplanned development have effected natural environment to the extent that some of our animal species are rapidly losing their habitats. In India five species of mammals and birds have become extinct in the recent past while 103 such species are listed as

endangered under the wildlife (protection) Act 1972 in an international Conference held in New Delhi in 1982, all the species of flora and fauna that are endangered have been listed and action is being planned by the Government of India to create biosphere reserves for their protection.

The tropical rain, forests are considered to house more species than any other habitat but most of these have been lost or disrupted already in the Western Ghats. In the North Eastern region the fast cycles of shifting cultivation are doing an extensive damage.

Knowledge of country's marine ecosystems is quite inadequate. Coral reefs, rich in limestone, have been thoughtlessly consumed for cement manufacture in the Gulf of Mannar (Tamil Nadu) and Protan Islands (Gujarat) and are threatened in Lakshadweep and Andaman Islands thus exposing the coastal area to sea erosion.

Marine reserves need recognition for protection of endangered marine species of Cetaceans (that include whales and porpoises), the Dugong or sea cows, and the sea turtles of which five of the seven species of the world have India as their habitat.

Thus, there is a compelling need for conservation and establishment of Biosphere Reserves. The 19 National Parks and 202 Wildlife Sanctuaries set up in the country represent 2.3% of the geographical area. But most of these cover insufficiently the ecological diversity of threatened habitat or even the endangered species. These also lack in scientific and effective management.

The Department of Environment, Government of India, in conjunction with Ministry of Agriculture established national parks sanctuaries and biosphere reserves with the following objectives :

1. To conserve for the present and future the diversity of biotic communities of plants and animals within natural ecosystems and to safeguard the genetic diversities of species on which their continuing evolution depends.
2. To provide areas for ecological and environmental research including baseline studies adjacent to these reserves.

Five areas have already been selected and establishment of biosphere reserve is underway. A dozen more areas that have potentialities have been identified.

Environmental Pollution

Pollution is the process which renders a resource unfit for use due to physical, chemical or biological factors. Of various kinds of pollution viz, air, water, land noise, radiation and odour that affect life in India, water pollution is the most serious in its impact. Fourteen major rivers carry about 85% of the surface run off. These cover 83% of the area within their drainage basins where 80% of the total population of the country lives. These rivers alongwith other minor ones, tanks, lakes etc. meet the fresh water needs of the population. Apart from satisfying various domestic needs these help in agriculture, industry, fisheries navigation and power generation and are receptable for community industrial and agricultural wastes. Water pollution results in spread of water borne disease like cholera, jaundice, typhoid and dysentery, fish kill and loss of productivity in agriculture. Investigations by the Central and State Boards for the Prevention and Control of water pollution reveal that the major sources of pollution of our national water courses including coastal waters are the discharge of community wastes from human settlements. Air pollution is usually associated with industrial growth and urbanisation. However, domestic sources that burn coal, cowdung, firewood or trash also contribute to it. Problem of air pollution is becoming serious particularly in major cities like Calcutta, Bombay and Delhi. The high incidence of asthma, bronchitis, cough, breathlessness, sneezing, nasal blocks in particular areas is the effect of presence of pollutants in the air beyond a safe level. Industrial and transport emissions have ill effects on crop productivity also. Pollution of Land occurs largely from unthoughtful disposal of solid wastes and the dumping grounds become breeding grounds for pests and disease spreading vectors

Impact of developmental project on environment

The unintended resultant impacts of implementation of developmental projects for thermal or hydro power generation, mining industry,

agriculture, human settlements etc. manifest themselves through one or more environmental problems discussed in the earlier sections. The result is the whole range of tropical communicable diseases like malaria, filariasis, dengue, guinea worm, Japanese encephalitis etc. that are becoming more widespread.

It is being recognised that much of the damage done can be minimised or even completely avoided by adequate planning using techniques like environmental impact analysis. Some limited analysis have been attempted but still there are constraints.

1. The interdisciplinary expertise for such work is yet to be built up.
2. There is no statutory backing to ensure compliance with the stipulations and provisions in respect of the essential safeguards emanating from environment impact analysis.
3. There is no machinery set up to systematically monitor the implementation of environmental safeguards for development projects.

Apart from legislation and administrative measures for the protection of environment, the greatest snag is the lack of public awareness regarding conservation and public participation in the protection of environment. The Government of India set up in November 1980 a full fledged Department of Environment under the leadership of the Prime Minister of India. It is a model agency for all environmental issues in the country. The major responsibilities of the Department include :

1. Appropriate action for environmental conservation and protection including appraisal of developmental projects.
2. Coordination with other ministers and agencies, voluntary organisations and professional bodies on environmental action plans.
3. Policy planning.

4. Promotion of research and development, training, manpower planning and creation of environmental awareness.
5. Liaison and coordination with global agencies involved in environmental problems.
6. Creating institutions at various levels in the academic sphere for the cause of environment.
7. Setting up of eco-development board for carrying out environment impact studies and
8. Evolving a legal system to cater to forthcoming environmental legislations.

Voluntary Organisations

India has an effective branch of the world wildlife fund at the international level. It also has five institutions like the Bombay Natural History Society, Wildlife Preservation Society of India, Friends of the Trees Asian Environment Society, Waste Land Development Society and several other similar organisation both at the national and regional levels. Parliamentarians also have set up a Parliamentary Environment Forum in 1981 which has a large membership from all political parties. It has conducted conference on environment for legislators focussing their attention on :

1. Pollution monitoring.
2. Conservation of critical ecosystems to be designated as Biosphere Reserves.
3. Conservation of marine ecosystems.
4. Protection of historical monuments from environmental pollutions.
5. Creating awareness in public by supporting specific projects.

Current formal and nonformal environmental education programmes

The two documents on school curriculum (i) curriculum for the ten year school : an approach Paper (1975) and (ii) Curriculum for the ten year school, a Framework (1975) lay special emphasis on environmental education. It should cut across the entire gamut of school education through relevant subjects. As sciences in general and biological sciences in particular are more directly linked with environment and its problems the pupil can be exposed to learning experiences through these experiences.

For the primary stage the second document recommended..... "the child should learn the method of inquiry in science and technology in the life and world around it.....The child should develop habits of cleanliness and healthy living and an understanding of the proper sanitation and hygiene of its neighbourhood. The child should take taste for the good and the beautiful and should take care of its surroundings."

As the middle stage the documents states : ".....environment education, nutrition health and population education should receive adequate attention so that science is related meaningfully to life."

At the secondary stage ".....in science and mathematics the student should have competence to apply his knowledge to the solution of problems around him. He should have an understanding of the technological processes in agriculture and industry in his surroundings. He should be able to contribute meaningfully to environment conservation, reduction of pollution, the development of proper nutrition health and hygiene in the community.

In a country like India where 31 states and Union Territories control education, it is difficult to have a common programme of studies nor is it desirable particularly in a field like environmental education. The environment and experience of children vary from place to place. Consequently the activities to be provided in the school ought to be so planned that knowledge, attitude, skills and commitment can be built on the solid foundation of experience the child draws from the environment.

Review Committee Report (1978) on the curriculum for the ten year school recommended introduction of a Socially Useful Productive Work

(SUPW) in the entire range of school education and gave it the status of a subject. The SUPW is purposive meaningful manual work resulting in foods or services useful to the society. It is envisaged as an educational instrument to bring about peaceful change in desired direction.

The activities under SUPW are related to six areas of food clothing, shelter, health and hygiene; recreation and community work and social service.

The nature of the activities

The EE objectives of awareness, knowledge, attitude, skills and participation have greater scope of realisation through relevant activities under SUPW. The flexible nature of its curriculum inherent in its implementation provide suitable and easy path for experimentation of any EE programme relevant to the local environment.

NCERT has developed instructional materials for environmental education. It has developed a composite course for classes I and II through a Teachers' Guide on environmental topics under seven Units Our Family, Our Home, Our School, Our Neighbourhood, Our Earth, Our Sky and Stories. In the three succeeding classes the child is introduced to social environment.

Beyond this social science subjects are taught as individual disciplines but the emphasis is on the interaction between man and his physical and social environment. The integrated science curriculum is environment based and directed to attain certain abilities essential for living in the changing environment. The instructional materials at the secondary and the higher secondary levels in science in general and biology in particular reflect a definite shift from the classical principle oriented content on plants and animals to the inclusion of contents of the emerging contemporary frontiers of the disciplines including environmental biology.

Unicef assisted projects, like Primary Education Curriculum Renewal, Developmental Activities in Community Education and Participation, Comprehensive Access to Primary Education, Children Media Laboratory, Nutrition/Health Education and Environmental Sanitation at Primary Stage are working keeping in view environment and its problems.

Non Formal Education

For environmental education in the non formal education some of the major objectives are :

1. To recognise the interdependence among materials in the physical environment plant and animal life; for survival growth and development.
2. To identify human, material space and time resources in the environment.
3. To make effective use of environmental resources for social economic and cultural survival and sustained development.
4. To understand that many diseases may be prevented by efforts leading to village/community of cleanliness, environmental sanitation, removal and prevention of pollution etc.
5. To recognise simple physical, biological, chemical principles and laws, and cause and effect relationship with reference to real life situations and use these to explain changes in the environment.

With these major objectives of environmental education in view a competency Model with Environment Oriented Need Based Approach has been developed.

Some of the difficulties in implementation of the programme of environmental education are :

1. Classroom teacher is unable to get proper guidance to carry out the planned activities ;
2. Supplementary and reference materials are not easy to get ;
3. The teacher gets little time to plan activities properly;
4. Constraint of covering the syllabus kill the initiative to be

innovative. And to add to this is the huge task of teacher education. In the preservice education this approach has to be defined clearly and then practised properly. In inservice education the teachers have to be oriented to this approach a task that defies all calculations in terms of programme, materials, resource persons, time and finances.

Future Plans

Man today is wide awake to the fact that the way he is going about he has become a menace to the rest of the living world and to himself. In his attempt to master the nature he is likely to become the victim of his own passion to kill nature. In his attempt at rapid development his reckless speed has made him blind to the future. And to save himself he has to save the rest of the living beings. He has to be responsible for not only himself but for the entire biosphere.

The imparting of this awareness and this responsibility to children i.e. the thoughtless exploitation of the environment today will mean destruction of tomorrow is the crux of the issue of environmental education.

Science and technology has helped in modernisation, acceleration of production, rapid consumption and exploitation of resource and mankind too. 30 per cent of the world's population living in developed countries is consuming 82% of the world's energy annually and is utilising this consumption level to perpetuate disparities between developed, developing and underdeveloped countries and also between the better placed urbanities and the disadvantaged rural poor.

Environmental education cannot function in isolation of the programmes of environmental management. NCERT has to play the key role of coordinating programme of environmental education at different levels but can do so only if it gets concrete ideas on environmental problems and their solutions from agencies working for environmental protection and conservation.

Some problems and tasks that need to be solved or undertaken in connection with the implementation of the environmental education programme at the national level are :

1. To prepare an approach paper defining objectives and strategies in environmental education at the national level.

2. To take suitable administrative decisions/actions for implementation of environmental education in schools at the national and state levels.
3. To examine and find in the existing curricula elements related to environmental education.
4. To develop on the basis of findings in (iii) curriculum materials in environmental education and to incorporate them in the existing school curricula.
5. To develop materials for environmental education in the field of non formal education to be used in classes, correspondence courses and through mass media.
6. To develop and implement a well planned programme of teacher education both preservice and inservice vis a vis environmental education.
7. To evaluate the impact of their programme of environmental education at suitable intervals of time.

Conclusion

Though awareness of the need of environmental education is there among the policy framers, top educators and scientists it has to percolate to the level of teachers who have to implement these programmes.

APPENDIX—X

List of Participants

1. Mr. Aminullah Amin
General Director of Students Affair
Teacher Training Department
Ministry of Education,
Kabul
Democratic Republic of Afghanistan
2. Md. Ismail Hossain
Assistant Professor
Khulna Teachers' Training College
P.O. Engineering College
Khulna
Bangladesh
3. Mr. M.P.W. Fernando
Inservice Adviser,
Ministry of Education
Colombo 2
Sri Lanka
4. Mr. K. Ravi
Faculty-in-charge
Environmental Planning,
School of Planning
Centre for Environmental Planning
and Technology, Navrangpura
Ahmedabad-380009
Gujarat (India)

5. Dr (Mrs) S. Srivastava
Principal
Dev Samaj College of Education for Women
Ferozepur-152002
Punjab (India)
6. Miss K. Vasudeva
Principal
Teachers' Training Institute
Daryaganj, Ansari Road,
New Delhi-110002 (India)
7. Dr. M.N. Siddique
Department of Science Education
SCERT., 3-Link Road,
Karol Bagh,
New Delhi-110005 (India)
8. Mrs. B. Baveja
Lecturer in Biology
Faculty of Education
Jamia Millia Islamia
Jamia Nagar
New Delhi-110025 (India)

List of Resource Persons

1. Dr. B.D. Atreya
Reader in Chemistry
DESM, NCERT,
New Delhi-110016
2. Shri K.J. Khurana
Reader in Physics
DESM, NCERT,
New Delhi-110016

3. Dr. J. Mitra
Reader in Zoology
DESM, NCERT,
New Delhi-110016
4. Dr. D. Lahiry
Reader in Zoology
DESM, NCERT,
New Delhi-110016
5. Dr. J.S. Gill
Lecturer in Botany
DESM, NCERT,
New Delhi-110016
6. Dr. U. Mallik
Lecturer in Biology
DESM, NCERT,
New Delhi-110016
7. Mr. K.B. Gupta
Lecturer in Botany
DESM, NCERT,
New Delhi-110016
8. Dr. (Mrs.) S.B. Malik
Lecturer of Chemistry
DESM, NCERT,
New Delhi-110016
9. Dr. J.C. Goel
Reader in Education
Department of Teacher Education,
NCERT,
New Delhi-110016

10. Dr. A.L.N. Sarma
Reader in population Education
DESSH,
NCERT,
New Delhi-110016
11. Mrs. S. Sinha
Lecturer
DESSH,
NCERT,
New Delhi-110016
12. Mr. G. Guru
Reader
Vocational Education Unit,
NCERT,
New Delhi-110016
13. Dr. (Mrs.) S. Bhattacharya
Reader in Biology
DESM,
NCERT,
New Delhi-110016
14. Dr. N.K. Jangira,
Reader in Education,
DTE,
NCERT,
New Delhi-110016

Coordinator

Dr. (Mrs.) N. Joshi
Reader in Zoology
DESM,
NCERT,
New Delhi-110016

Course Organiser

Dr. (Mrs.) G.R. Ghosh
Head, DESM,
NCERT,
New Delhi-110016

Unesco Representative

Dr. Abdul Ghafoor
Unesco Representative
Programme Specialist
Environmental Education Section
Division of Sc. Technical & Vocational Education
7-Place de Fontenoy-75700
Paris.

APPENDIX—XI

Working Groups

The following four groups were formed for discussion on each module.

Group A

Mr. Aminullah Amin (Afghanistan)
Dr. M. N. Siddique (Delhi, India)
Dr. S. Srivastava (Punjab, India)
Mr. K. B. Gupta (NCERT, India)
Mr. R. Joshi (NCERT, India)

Group B

Md. Ismail Hossain (Bangladesh)
Mrs. B. Baveja, (Delhi, India)
Dr. D. Lahiry (NCERT, India)
Dr. A. L. N. Sarma (NCERT, India)
Dr. J. S. Gill (NCERT, India)

Group C

Mr. M. P. W. Fernando (Sri Lanka)
Dr. Mrs. N. Joshi (NCERT, India)
Mr. G. Guru (NCERT, India)
Dr. (Mrs) S. B. Malik (NCERT, India)
Mrs. S. Sinha (NCERT, India)

Group D

Mr. K. Ravi (Ahmedabad, India)
Miss K. Vasudeva, (Delhi, India)
Dr. B. D. Atreya (NCERT, India)
Dr. J. C. Goel (NCERT, India)
Dr. U. Mallik (NCERT, India)

Dr. N. K. Jangira and Dr. J. Mitra (both from NCERT, India) also participated in group discussions on March 8 and 14 respectively.

APPENDIX—XII

Daily ScheduleSUB-REGIONAL WORKSHOP ON TEACHERS TRAINING IN
ENVIRONMENTAL EDUCATION

3.3.1983 (Thursday)

Morning Session	Moderator	Rapporteur	Speaker
10 AM to 11 AM	Registration		
11 AM to 12.30 PM	Inauguration		
12.30 PM to 1 PM	Coffee Break		
1 PM to 2 PM	Lunch		
Afternoon Session			
2 PM to 5 PM	Country Report	Mr. M.P.W. Fernando	Dr. S. B. Malik
		Dr. N. N. Joshi	Dr. U. Mallik
			Mr. R. Joshi

4-3-1983 (Friday)			Dr. A. Ghatge
Morning Session			
10 AM to 11 AM	Presentation UNESCO- UNEP International Environmental Education Programme		
11 AM to 1 PM	Country Report	Mr. M.P.W. Fernando Dr. N. Joshi	-do-
1 PM to 2 PM	Lunch		
Afternoon Session			
2 PM to 3 PM	Strategies for Developing an Environmental Education Curriculum	-do-	Mr. R. Joshi
3 PM to 5 PM	Discussion	-do-	-do-
Field Trip		5-3-1983 (Saturday)	
Holiday		6-3-1983 (Sunday)	

7-3-1983 (Monday)

Morning Session

10 AM to 11 AM	Strategies for the training of teachers	Mr. Aminullah Amin	Dr. S. B. Malik	Sh. K. B. Gupta
	Environmental Education	Dr. J. C. Goel	Dr. U. Mallik	
11 AM to 1 PM	Discussion	-do-	Mr. R. Joshi	-do-
1 PM to 2 PM	Lunch			
2 PM to 5 PM	Film Show			

8-3-1983 (Tuesday)

Morning Session

10 AM TO 11 AM	Introduction to Module 1.	Miss. K. Vasudeva	-do-	Dr. (Mrs) S. B. Malik
11 AM to 1 PM	Group work and discussion	Dr. B. D. Atreya		
1 PM to 2 PM	Lunch			

Afternoon Session

2 PM to 3.30 PM	Group work and discussion	-do-	-do-	
3.30 PM to 5 PM	Presentation of Report	-do-	-do-	

9-3-1983 (Wednesday)

Dr. J. S. Gill

10 AM to 11 AM Introduction to
Module 2

Dr. B. D. Atreya
Mr. G. Guru
Dr. N. Jangira
Dr. D. Lahiry

-do-

11 AM to 1 PM Group work and
discussion

-do-

-do-

1 PM to 2 PM Lunch

Afternoon Session

2.00 PM to 3.30 PM Group work

-do-

-do-

3.30 PM to 5.00 PM Presentation of Report

-do-

-do-

10-3-1983 (Thursday)

Morning Session

10 AM to 11 PM

Introduction to
Module 6

Mr. K. Ravi
Dr. A. L. N. Sarma

-do-

11 AM to 1 PM Group work

-do-

-do-

1 PM to 2 PM Lunch

Mrs. S. Sinha

Afternoon Session

2.00 PM to 3.30 PM	Group work and discussion	-do-	-do-
3.30 PM to 5.00 PM	Presentation of Report	-do-	-do-

11-3-1983 (Friday)

Morning Session

10 AM to 11 AM	Introduction to Module 3	Md. I. Hossain Dr. D. Lahiry	-do-	Dr. (Mrs) N. Joshi
11 AM to 1 PM	Group Work and Discussion	-do-	-do-	
1 PM to 2 PM	Lunch			

Afternoon Session

2 PM to 3.30 PM	Group Work	-do-	-do-
3.30 PM to 5 PM	Presentation of Report.	-do-	-do-

12-3-1283 (Saturday)

13-3-1983 (Sunday)

Field Trip

14-3-1983 (Monday)

Morning Session

10 AM to 11 AM Introduction to

Module 4

Dr. (Mrs.) S. Srivastava

Dr. D. Lahiry

11 AM to 1 PM Group Work and

Discussion

Dr. J. Mitra

-do-

Dr. U. Mallik

1 PM to 2 PM Lunch

Afternoon Session

2.00 PM to 3.30 PM Group Work

-do-

3.30 PM to 5.00 PM Presentation
of Report

-do-

15-3-1983 (Tuesday)

Morning Session

10 AM to 11.30 AM

Discussion and suggestions concerning modality of actions for local adaptation of the above series of modules to local environmental situations and academic levels and needs of target teachers

Dr. (Mrs)

S. Bhattacharya
The entire group

-do-

11.30 AM to 1 PM

Identification of Interested institutions for the local adaptation of the modules

-do-

1.00 PM to 2.00 PM Lunch

Afternoon Session

2.00 PM to 4.00 PM

Suggestions concerning needed teacher training documents, materials and activities in environmental education to be undertaken at the sub-regional and national levels

-do-

16-3-1983 (Wednesday)

Morning Session

10 AM to 1 PM

Finalisation and adoption
of the report of the.

Workshop

1 PM to 2 PM

Lunch

2 PM to 5 PM

Valedictory



